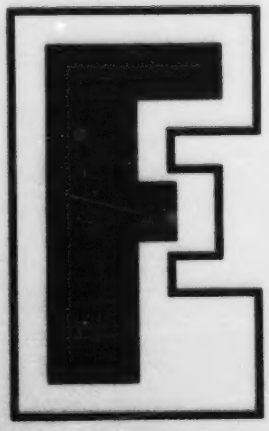

Economics & Forecasts Division
Corporate Planning Branch

LONG-TERM ECONOMIC OUTLOOK
ANNUAL REVIEW

September 1988

This Review replaces the
September 1987 Long-Term Economic Outlook
The forecasts contained in it have been approved by the
Vice-President, Corporate Planning.
They have the status of Corporate Predictions as defined under
Section 7 of the OOOH Manual.

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APPENDIX

Table 1 - Summary of Historical and Forecast Data
- Rates and Percentages

Table 2 - Summary of Historical and Forecast Data
- Levels and Indexes

1.0 FORECAST TABLES

1.1 ONTARIO

	Actual			Forecast				
	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2025
Annual Average Percentage Change:								
Real Gross Domestic Product	2.5	3.7	3.6	3.2	2.8	2.4	2.1	1.7
Consumer Price Index	8.6	7.6	4.6	4.5	5.0	5.5	5.0	5.0
Average Hourly Earnings:								
Manufacturing	9.5	8.1	4.7	5.8	6.0	7.0	7.0	6.5
Construction	9.6	6.1	5.0	5.8	5.9	7.0	7.0	6.5
Population	1.0	1.0	1.6	1.1	0.8	0.6	0.5	0.4
Labour Force	2.7	1.9	2.4	1.3	1.0	0.8	0.6	0.0
Employment	2.5	1.7	3.1	1.5	1.0	0.9	0.5	0.0
Labour Productivity	0.0	1.9	0.5	1.7	1.9	1.5	1.6	1.7
Annual Average Rates:								
Unemployment Rate	6.7	8.8	5.7	4.1	4.1	3.8	3.8	3.8

1.2 CANADA

	Actual		Forecast					
	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2025
Economic Growth Indicators: (Annual Avg Percentage Change)								
Real Gross Domestic Product	4.0	2.9	3.1	3.2	2.6	2.6	2.1	1.7
Population	1.1	1.1	1.0	0.8	0.7	0.6	0.5	0.4
Labour Force	3.0	1.8	1.9	1.0	0.6	0.6	0.4	0.0
Employment	2.9	1.1	2.4	1.4	0.8	0.6	0.4	0.0
Labour Productivity	1.1	1.8	0.7	1.8	1.8	2.0	1.7	1.7
Unemployment Rate (%)	7.7	10.5	8.4	7.3	5.3	5.0	5.0	5.0
Cost Indicators: (Annual Avg Percentage Change)								
GDP Deflator	8.3	6.2	4.5	4.4	5.0	5.5	5.0	5.0
Consumer Price Index	8.7	7.5	4.4	4.2	5.0	5.5	5.0	5.0
Industry Selling Price (Mfg)	10.0	5.4	3.4	5.4	5.5	5.5	5.0	5.0
Average Hourly Earnings (Mfg)	10.1	8.2	4.0	5.3	5.9	7.0	7.0	6.5
Interest Rates (Annual Avg Rate):								
Treasury Bill Rate	10.14	12.5	9.0	8.2	8.2	8.1	7.6	7.1
Bank Prime	11.09	13.8	10.2	9.0	9.0	9.0	8.5	8.0
Government of Canada Bonds:								
5 years	9.58	12.5	9.3	9.0	9.0	9.0	8.5	8.0
20 years	9.99	13.2	9.8	9.2	9.5	9.5	9.0	8.5
Real Prime	1.2	6.4	5.7	4.8	4.0	3.5	3.5	3.0
Federal Deficit (% of GNP)	3.3	5.4	4.1	3.0	2.5	2.0	1.0	1.0
Canadian Dollar in US Cents	90.8	79.3	77.4	79.0	80.0	78.0	77.0	75.0
Net Capital Inflows (% of GDP)	2.6	1.4	2.2	2.5	2.5	1.5	1.0	0.0

1.3 UNITED STATES

	Actual		Forecast					
	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2025
Annual Average Percentage Change:								
Real Gross National Product	3.4	2.6	2.7	2.5	2.5	2.5	2.3	2.0
Consumer Prices	8.9	5.5	3.8	4.5	5.0	5.0	5.0	5.0
Hourly Wages	8.6	5.6	3.8	5.2	6.0	6.5	6.5	6.5
US $ Billions (1983 $):								
Balance of Payments, Current Account	-7	-51	-117	-82	-30	-10	10	10
Average Annual Rate:								
Prime Interest Rate	10.13	13.30	8.9	8.4	8.5	8.0	7.8	7.5
Government Bond Yields								
3 to 5 year maturity	8.65	11.52	7.9	8.0	8.0	7.7	7.5	7.0
10 to 20 year maturity	8.91	11.85	8.7	8.5	8.5	8.2	8.0	7.5

1.4 WESTERN EUROPE AND JAPAN

	Actual		Forecast					
	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2025
REAL GROSS DOMESTIC PRODUCT[1]								
West Germany	3.4	1.2	2.1	2.0	2.0	2.0	2.0	2.0
Switzerland	1.1	1.1	2.1	2.1	2.2	2.2	2.2	2.2
United Kingdom	1.7	1.6	2.8	2.1	2.0	2.0	2.0	1.9
Japan	5.1	4.3	3.5	3.6	3.6	3.5	3.5	3.5
CONSUMER PRICE INDEX[1]								
West Germany	4.1	3.9	1.3	3.0	3.5	4.0	4.0	4.0
Switzerland	2.4	4.3	2.0	3.2	3.5	4.0	4.0	4.0
United Kingdom	14.4	7.2	4.5	4.5	4.5	4.5	5.0	5.0
Japan	6.5	2.7	1.3	3.5	4.0	4.5	4.5	4.5
WAGES[1]								
West Germany	6.2	4.0	4.3	5.3	5.5	5.5	5.5	5.5
Switzerland	3.0	3.9	3.7	4.7	5.0	5.0	5.5	5.5
United Kingdom	14.9	10.3	7.9	7.0	6.5	6.5	7.0	7.0
Japan	8.1	4.6	4.4	5.2	6.0	6.5	6.5	6.5
GOVERNMENT BOND RATES								
West Germany	7.0	6.4	6.2	6.3	6.5	6.5	6.5	6.5
Switzerland	4.1	4.8	4.2	4.7	5.0	5.0	5.5	5.5
United Kingdom	12.0	11.9	9.7	9.3	8.7	8.5	8.0	8.0
Japan	7.8	7.6	4.8	5.3	6.5	7.0	7.0	7.0
WHOLESALE PRICE INDEX[1]								
West Germany	3.9	3.4	0.1	3.0	3.5	4.0	4.0	4.0
Switzerland	1.0	2.9	0.0	3.0	3.5	3.5	4.0	4.0
United Kingdom	14.9	6.9	4.6	4.5	4.5	4.5	4.5	4.5
Japan	5.9	0.0	-1.8	3.0	3.5	3.5	4.0	4.0
EXCHANGE RATES[3] (CURRENCY/$US)								
Deutschemark	2.10	2.60	1.87	1.65	1.53	1.47	1.39	1.22
Swiss Franc	2.00	2.18	1.56	1.40	1.31	1.26	1.19	1.04
Japanese Yen	244	236	141	128	120	117	114	108
EXCHANGE RATES[3] ($US/CURRENCY)								
Deutschemark	0.476	0.385	0.535	0.606	0.653	0.681	0.717	0.822
Swiss Franc	0.499	0.458	0.641	0.714	0.763	0.794	0.840	0.962
UK Pound	1.990	1.580	1.648	1.600	1.620	1.650	1.650	1.650
Japanese Yen*	0.409	0.423	0.709	0.781	0.833	0.855	0.877	0.926
EXCHANGE RATES[3] ($CDN/CURRENCY)								
Deutschemark	0.524	0.485	0.691	0.763	0.816	0.869	0.926	1.092
Swiss Franc	0.550	0.578	0.828	0.893	0.954	1.013	1.085	1.278
UK Pound	2.190	1.990	2.129	2.015	2.025	2.104	2.132	2.191
Japanese Yen*	0.450	0.533	0.916	0.969	1.041	1.091	1.133	1.230

[1] Annual Average Percentage Change
[2] Retail Price Index
[3] Average Rate for period
* Per 100 yen

1.5 ENERGY

	Actual			Forecast							
	1987	1988	1989	1990	1991	1992	1991-1995	1996-2000	2001-2005	2006-2010	2011-2025
	dollars						<annual percentage change>				
WORLD OIL PRICES											
$ per Barrel											
Persian Gulf Light Crude - FOB											
Annual Average Price											
Current US Dollars	17.20	15.00	17.20	18.75	19.75	21.00	7.0	9.4	7.5	5.0	5.0
Constant US 1988 Dollars	17.90	15.00	16.40	17.10	17.30	17.70	2.5	4.2	2.4	0.0	0.0
Average Cost Light Crude (WTI)[1]											
Chicago Refiners											
Current US Dollars	19.16	17.00	19.00	20.50	21.50	23.00	7.0	9.1	7.3	5.0	5.0
Constant US 1988 Dollars	19.90	17.00	18.10	18.70	18.90	19.40	2.5	3.9	2.2	0.0	0.0
CANADIAN CRUDE OIL AND NATURAL GAS PRICES											
Canadian $ per Barrel:											
Ontario Refinery Acquisition Cost (Light Crude)											
Annual Average Price											
Current Dollars	24.25	21.00	23.75	26.20	27.75	29.30	5.7	10.2	7.7	5.3	5.0
Constant 1988 Dollars	25.30	21.00	22.60	23.90	24.30	24.50	1.1	4.7	2.0	0.3	0.0
Natural Gas:											
Canadian $ per Million Btu's:											
Average Wholesale Price at Toronto[2]											
Annual Average Price											
Current Dollar	3.70	3.35	3.60	3.90	4.20	4.40	6.0	10.1	7.6	5.3	5.0
Constant 1988 Dollars	3.85	3.35	3.45	3.55	3.65	3.70	1.5	4.8	2.0	0.3	0.0

[1] West Texas Intermediate
[2] The weighted average of negotiated prices for Ontario

2.0 ECONOMIC GROWTH

2.1 Overview

Growth in the productive capacity of the economy comes from two sources. First, growth in the factors of production, such as additions to the capital stock through net investment, or a growing labour force. Second, growth in productivity, or getting more output for less input. Table 2.1.1 shows the decomposition of output growth in the Ontario economy.

Table 2.1.1

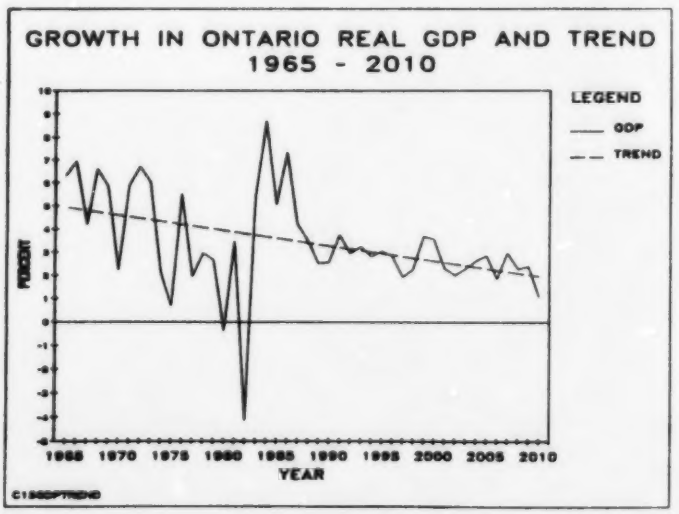
Contributions to Ontario Real Output Growth
(Annual Average Percent Change)

	1962-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011-2025
Employment X(0.73)	2.2	2.6	2.4	1.8	1.2	2.3	1.1	0.7	0.6	0.4	0.0
Capital Stock X(0.27)	1.1	1.4	1.4	1.5	1.2	1.6	1.1	1.0	0.9	0.9	0.8
Total Factor Productivity	2.8	1.5	0.1	-0.8	1.2	-0.3	1.0	1.2	0.9	0.9	0.9
Real GDP	6.1	5.5	3.9	2.5	3.7	3.6	3.2	2.8	2.4	2.1	1.7

Note: The growth rates shown for employment and capital are the result of multiplying their actual growth rates by 0.73 and 0.27, which represents the relative importance of each factor in the aggregate production process. The totals may not sum, due to rounding.

Economic growth is expected to trend down (Chart 2.1.1).

Chart 2.1.1



The slowing in expected real GDP growth follows from the forecasted employment growth.

Labour force growth is being influenced by four major factors, fertility, participation, migration and eventually, retirement. Ontario's birth rate has been below replacement and this is beginning to affect labour force growth (with the appropriate lag). In addition, the rise in the number of women seeking jobs is expected to taper off as an upper limit is reached. While Ontario has benefitted from a lot of migration recently, we cannot rely on this as a future source of growth. Demographic trends are discussed in more detail in Section 2.2

Capital stock growth rates projected for the future are quite a bit lower than historical rates. One reason is that the recent investment boom is seen as a temporary reaction to earlier slow investment growth. Also, Canada is not expected to be a major recipient of foreign capital over most of the next forty years. (Part of the decade following a free trade agreement would be an exception to the trend.) Capital investment and savings are examined in Section 2.3.

The productivity of the economy is covered in Section 2.4 and the prospects for industrial growth can be found in Section 2.5. The effects of a free trade deal between Canada and the United States have been incorporated into this Outlook. For more details on the impact of the agreement, the reader is referred to The Economic and Load Impacts of the Canada-US Free Trade Agreement [Economics and Forecasts Division 706.01 (#247), April 1988].

2.2 Demographic Trends

The overall trends are similar for Ontario, Canada and the United States. For this reason, only Ontario's population and labour force projections are highlighted in the following discussion.

2.2.1 Population

Population growth has slowed considerably since the 1950s (Table 2.2.1). This growth can be divided into its components: fertility, mortality and migration.

Table 2.2.1
Population Growth, Average Annual Rates
1951-1986
(Per Cent)

Years	Ontario	Canada	US
1951-1959	3.3	2.7	1.7
1960-1969	2.2	1.9	1.3
1970-1979	1.4	1.2	1.1
1980-1985	1.1	1.1	1.0
1986	1.2	0.7	1.0

Source: Statistics Canada

2.2.1.1 Fertility

The average number of children a woman is expected to have in her lifetime, known as total lifetime fertility, fell steadily from 1960 to 1981. Since 1981 the total fertility rate has risen slightly in Ontario and flattened out at the current 1.7 children per woman (Chart 2.2.1). The replacement rate for Ontario is 2.1.

There are several factors that have lowered the fertility rate. Increased urbanization in North America has lowered fertility rates below those of a once more rural society.

Two other factors have tended to reduce the number of children a woman has during her life. One is the trend to more education. This decreases fertility among the young. The falling fertility rate of the 15-24 age group can be seen in Chart 2.2.2. Finally, the increase in female participation in the labour force has delayed marriages and the first child. This is reflected in the increasing age of the mothers at birth shown in Chart 2.2.3.

Some recent factors would suggest an increasing fertility rate in North America.

Child care has become increasingly available and affordable. Also fertility has risen among older women as births have been postponed until the mother is over 30. This can be seen among the 30-39 age group in Chart 2.2.2. If the trends in the age specific fertility rates were continued in Ontario, the replacement rate of 2.1 children per woman would be reached by the year 2000. We do not think that this will happen. Rather, the factors decreasing the fertility rate will continue to offset the positive influences. As a result, fertility should be around 1.9 over the forecast period.

There are some risks associated with the fertility forecast.

Recently, there has been a greater social acceptance of DINK (dual income, no kids) households. Also, fear of AIDS has increased awareness of contraception, and access to abortion has contributed to a lower birth rate.

A new Divorce Act came into effect on June 1, 1986. This has dramatically increased the ease and number of divorces in Canada (78,160 divorces in Canada in 1986, up 26.1% from 1985; Ontario divorces increased by 35%). Previously the number of divorces was falling from 1983 to 1985. The full effect of the new legislation will not be known for some time. A rising divorce rate lowers the fertility rate.

Chart 2.2.1

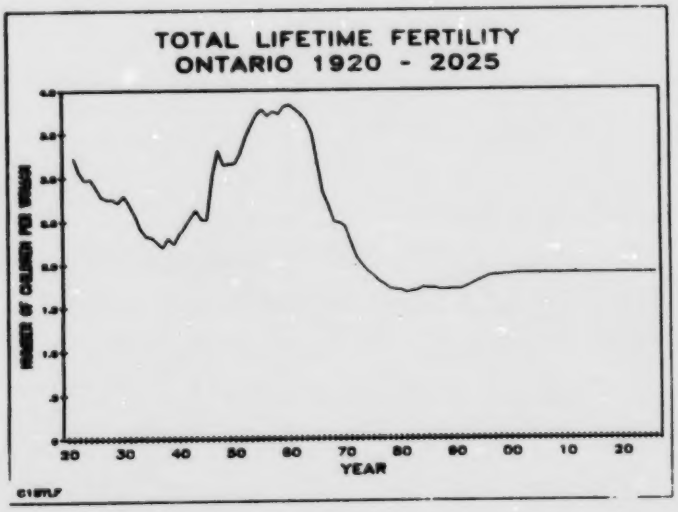


Chart 2.2.2

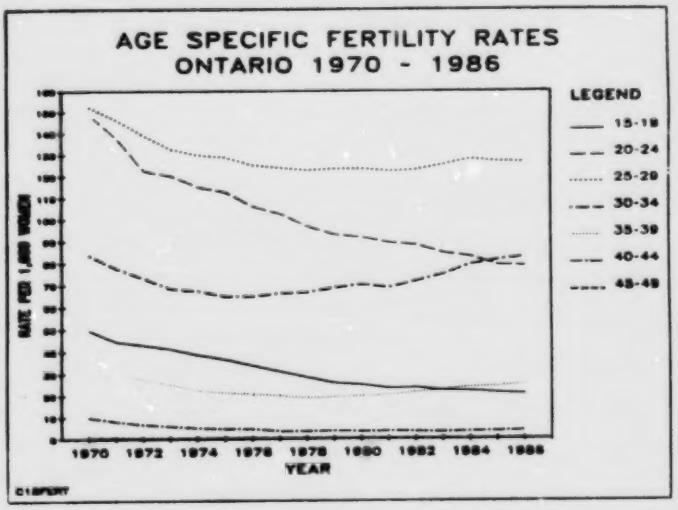
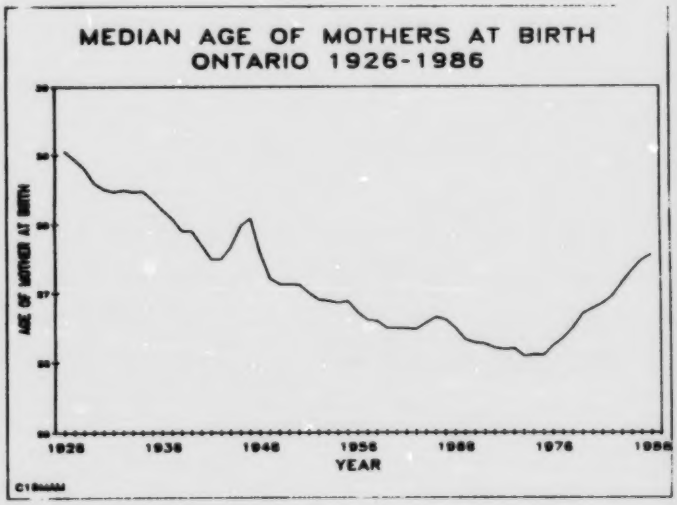


Chart 2.2.3



2.2.1.2 Mortality

A trend towards lower mortality has resulted from advances in the treatment of heart disease, the detection of cancer, and generally more healthy lifestyles.

Mortality in Ontario is low by international standards and so there is little room for improvement.

2.2.1.3 Migration

Migration has been in the spotlight recently because it is seen as a way of making up for the forecast labour shortages.

The Federal Government introduced a new policy in 1988 relaxing the rules governing immigration of family members. This has come in a year of much pressure on government to increase targets for immigration, because of aging and a slow growing population. The policy is a relaxation of the previous policy of attracting only entrepreneurs.

In the United States preferential treatment is still given to family members, rather than to skilled workers. Of the 500,000 US nonrefugee immigrants in 1986, 470,000 had family sponsors. Two bills before the Senate are trying to introduce a point system similar to Canada's and Australia's.

With annual emigration of 50,000 persons and a total fertility rate of 1.7 births per woman Canada will need 175,000 immigrants a year to stabilize its population at 25,000,000. The Conservative government in Canada has not met its targets in the past (Table 2.2.2) and while immigration numbers are expected to rise, a return to the boom numbers after World War II cannot be expected.

Table 2.2.2
Canadian Federal Immigration
Targets and Actual Immigration
1985-1988

Year	Target	Actual
1985	90-100,000	84,302
1986	100-115,000	99,219
1987	115-125,000	146,994(*)
1988	125-135,000	

(*) This year's immigration figures do not reflect an easing of policy since they include an amnesty in 1987 for refugees that were an administrative backlog from 1986.

There has been a large growth in refugees to Canada in the last few years. This increase will be moderated by new government bills (C-55 and C-84) which will cut the number of refugees in half; 17,000 applications are expected next year, of which about 7,500 will be accepted. Ontario is expected to have trouble attracting immigrants in future. Net immigration (international plus interprovincial) is forecast to fall from the estimated current 81,000 (1986-87) to a relatively constant 39,000 by the late 1990s.

2.2.2 Labour Force

Labour force growth rates of 3-3.5% seem to be a thing of the past as declining population and aging become dominant factors.

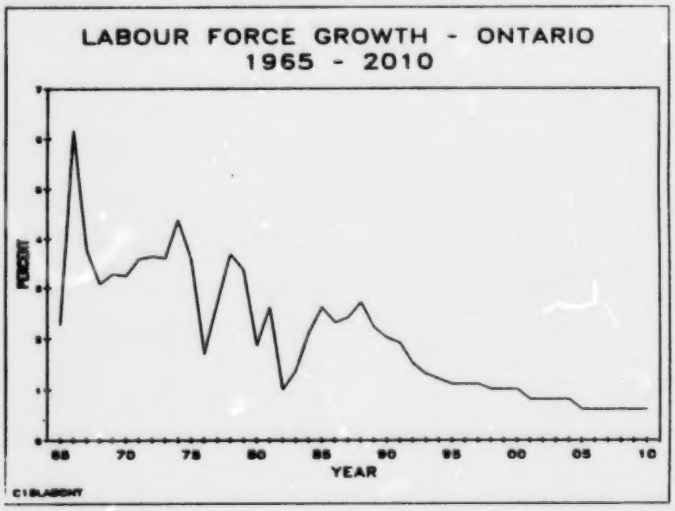
Male participation is expected to remain flat after its slow decline over the last few decades. Influencing factors such as unemployment insurance coverage and pension programs are not expected to change on balance; early retirement may be counterbalanced by some people working beyond age 65 or by some tightening of the unemployment insurance system.

Female participation should level off around the turn of the century, as an upper limit is reached.

Labour shortages by the end of the forecast period could encourage some to postpone retirement. After 2010, the baby-boom generation is expected to retire, and even with lax government immigration policies, late retirement, and more participation, labour force growth is forecast to be slow or non-existent.

Unemployment rates have trended down since 1983. The Ontario labour market has been quite tight and this has encouraged much of the immigration to this province. Unemployment rates of 5.0% and 3.8% are forecast for Canada and Ontario by 2010. Historical and forecast labour force growth is shown in Chart 2.2.4.

Chart 2.2.4



2.2.3 Population Aging

At the end of the forecast period (2010 on) the baby-boom generation starts to retire. The aging of the population will be one of the major challenges of the 21st century.

Table 2.2.3 shows that the proportion of Ontarians under 18 years of age will have decreased to 22.1% by 2025 from 28.1% in 1980, whereas those 65 and over will have their share increased by almost nine percentage points to 18.6% during the same period. A similar aging process is occurring in the United States according to the middle series projection made by

the Bureau of the Census. Canadian trends forecast by Statistics Canada are the same.

Table 2.2.3

The Projected Size of Young and Elderly Populations in Ontario, the United States and Canada

(Per Cent of Total)

	Ontario		United States		Canada	
	Under 18	65+	Under 18	65+	Under 18	65+
1980	28.1	9.8	(1982) 27.0	11.6	(1981) 28.1	9.7
1985	25.6	10.5	26.3	12.0	(1986) 26.8	10.0
1990	24.9	11.5	25.8	12.7	(1991) 24.3	11.9
1995	24.7	12.3	25.9	13.1	(1996) 22.7	13.1
2000	24.5	12.7	25.1	13.1	(2001) 20.7	14.0
2005	23.6	13.1	23.9	13.1	(2006) 18.7	14.7
2010	22.8	13.8	22.9	13.8	(2011) 17.3	16.1
2015	22.3	15.3	22.4	15.4	(2016) 16.6	18.4
2020	22.1	17.1	22.3	17.3	(2021) 16.2	21.0
2025	22.1	18.6	22.0	19.5	(2026) 15.6	23.9

Source: Ontario Hydro, Economics and Forecasts Division; US Department of Commerce, Bureau of the Census, Population Estimates and Projections, October 1982; and Statistics Canada, Population Projects for Canada, Provinces and Territories, 1984-2006, 91-520, May 1985.

In the 2010 to 2025 period the dependency ratio (non-working age/working age) could become a problem. The government spends more on an old non-working population than on young non-workers. In the United States, $2-$3 is spent on those 65 and older for every $1 spent on those under 15. In Canada, David Foot estimates this to be a 8:1 ratio, implying that government expenditure could increase significantly towards the end of the forecast.

2.3 Capital Investment

Real capital stock growth is forecast to be 3% per year in Ontario. The short term investment outlook puts capital stock growth at a peak growth rate of 6.6% in 1988. The long-term outlook has this growth falling to 3% around 2010.

The forecasted average growth is lower than historical as services and information become more important components in

growth (at the expense of the primary resource sector). Investment in human capital (education and training) will become more important than currently as productivity becomes the main source of growth. Two offsetting factors are that manufacturing is expected to retain its share of the Ontario economy, and falling labour force growth could mean that capital growth will accelerate beyond current expectations.

2.3.1 Domestic Saving

There has been an increasing importance of private savers, and a decreasing role of government as a saver. The personal sector has doubled its share of total savings from the 1950s and 1960s during the 1980s. The government sector has generally run deficits and switched from a supplier to a user of funds. Meanwhile, the corporate sector has changed very little. Chart 2.3.1 and Table 2.3.1 show these trends.

Personal savings should peak in the 2010s when the baby-boom generation finishes building savings for its retirement. In the interim the proposed tax reform, which switches towards a consumption tax, will encourage saving. The RRSP will probably continue to be a favourite vehicle for saving, given its tax treatment and the removal of the interest income exemption on other forms of savings.

The life-cycle model of consumption and saving has some predictions about the savings of an aging society. The early years of the life cycle are typically characterized by low saving or dissaving. Saving becomes positive, reaching a peak sometime before retirement, after which point there is dissaving. Aggregate savings rates (Savings/Personal Disposable Income) fall as the baby boom generation pass through the family formation stage, rise as they earn more, and fall again when they retire.

The Ontario savings rate (Savings/Personal Disposable Income) peaked in 1982 and has recently been on a downtrend. The forecast has the savings rate falling to around 10% by the mid 1990s. The rate is expected to rise in the 1995-2010 period as baby boomers age. The same trend is expected for Canada but the rate will be lower than Ontario.

Chart 2.3.1

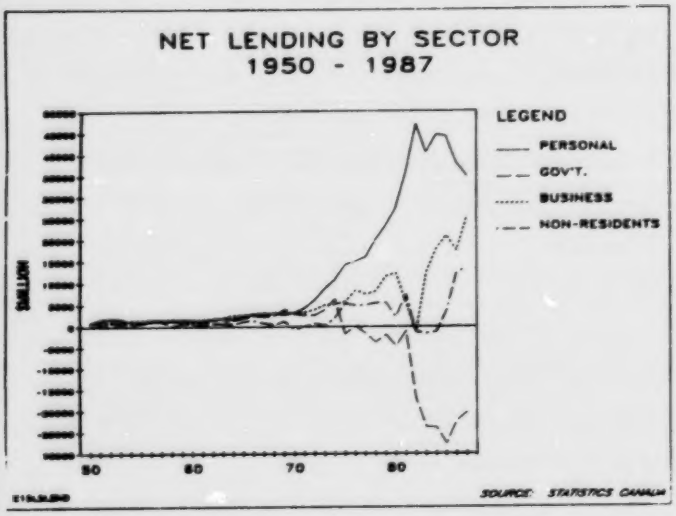


Table 2.3.1

Source of Saving
Canada 1950-1987

	Personal	Gov't	Bus	Non-Res
1950-1959	32%	18%	31%	19%
1960-1969	30%	21%	35%	14%
1970-1979	53%	9%	29%	9%
1980-1987	107%	-50%	34%	8%

Source: Statistics Canada

2.3.2 Foreign Capital

Foreign direct investment has been instrumental to Canada's economic development. It offered Canadians a means to a higher and technologically more advanced standard of living than would otherwise have been possible. In recent times, however, slower economic growth, the emergence of newly industrialized countries, the changed role of the United States from a creditor to a debtor nation, and to some degree nationalistic sentiments have combined to slow the flow. This trend is expected to continue in future.

At first glance it may appear that Ontario will have the most to lose from a reduced flow of foreign direct investment. Ontario's industrial base, particularly manufacturing, is partly built on foreign capital and technology. The automotive industry-related investment of late is a case in point.

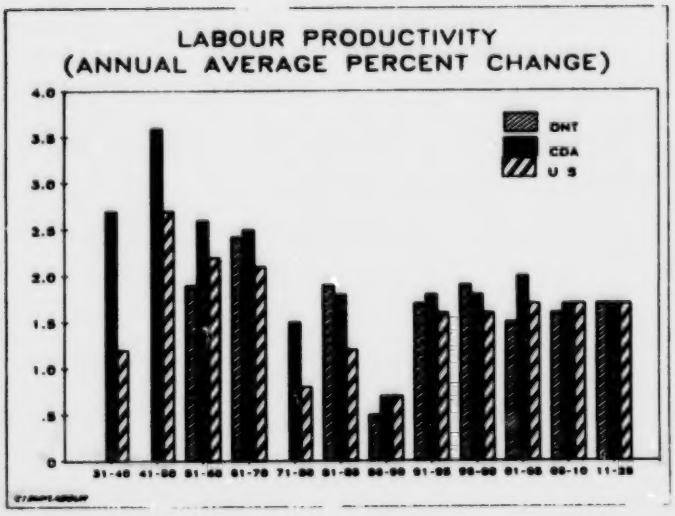
Bear in mind though that the current pattern of foreign investment can be quite different from the old. In some cases, the new investment is made not just to serve the local Canadian market, but is designed to supply the entire North American, and sometimes world, market. This world product mandating is a fundamental departure from the old branch plant concept, and marks the coming-of-age of Ontario's industry. Foreign residents will likely find fewer investment opportunities in Canada and opt instead to go to developing countries whose goods-production capability continues to expand rapidly, producing high productivity growth and high returns. As a mature industrial country, Canada may not need as much foreign investment as in

the past. Moreover, as discussed above, given the saving habit and age profile of Canadians, there should be ample capital available domestically for such endeavors, and conceivably by the turn of the century (or even earlier) Canada would become a net exporter of capital, a trend which is likely to persist well into the early years of the next century. Free trade will increase foreign investment especially for the first decade or so, but is unlikely to halt a long-term declining trend.

2.4 Productivity Growth

While demographic changes suggest lower growth rates ahead, productivity considerations suggest that the slowdown in growth will be moderated.

Chart 2.4.1



2.4.1 The 1960s and 1970s Slowdown

The period from 1965 to 1980 was characterized by a noticeable decline in labour productivity. (This somewhat misleading term is an accounting catch-all which when summed with employment growth equals total growth, ie, it does not distinguish among more efficient use of labour, more efficient use of capital and simply more capital.) A variety of reasons have been offered for this decline but in most cases they only partially explain the phenomenon. Some of the favoured rationales include:

- a surge of young and inexperienced baby boomers entered the labour force.

- a sharp rise in energy prices rendered much of the existing capital stock obsolete.

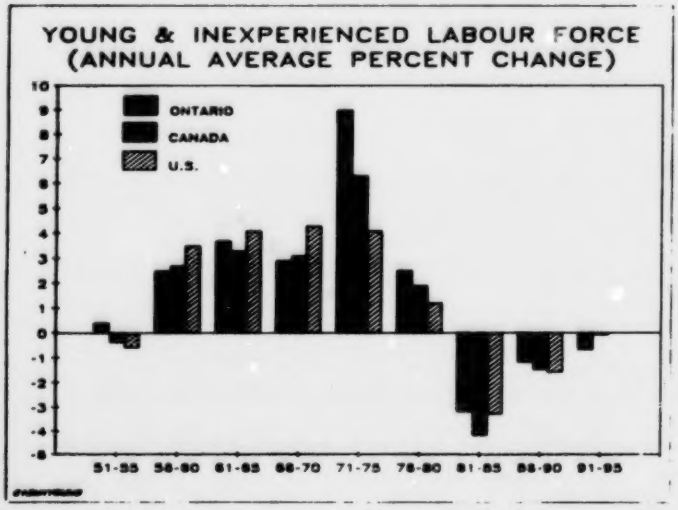
- a problem of persistent and rising inflation (a) meant that cost-based accounting systems made inadequate allowance for replacement of depreciated capital stock and (b) caused a shift of "investment" activity towards inventory accumulation/takeovers rather than the creation of new plant and equipment.

- antipollution laws added costs without corresponding gains in production.

An additional increment of capital is likely to increase productivity so that a more useful approach may be to look at shifts and expected shifts in the ratio of capital to labour. The capital to labour ratio has been heavily influenced by demographic changes -- the coming of age of the baby boom generation that began in the mid-1960s and the continuing dramatic rise in women's labour force participation rates. The labour force grew faster than the capital stock during much of the 1960s and 1970s, resulting in a declining capital to labour ratio and lower rates of productivity gain.

2.4.2 Changes During the 1980s

Chart 2.4.2



Although women's participation rates continue to rise, there is no longer the same surge of baby boomers into the labour force. The number of people in the 16 to 24 year old category has been falling, both in absolute numbers and as a proportion of the total labour force. If the rate of capital investment merely remained constant, this would seem to imply a much higher ratio of capital to labour increments (assuming constant unemployment) and lead to higher productivity gains. While Ontario, Canada and the United States have seen improvements in productivity, these gains have sometimes been less than might have been expected given the demographic changes in the labour market. The explanation for this seeming anomaly is that the recession early in the period created a pool of unemployed labour that is now being rapidly drawn down: unemployment is declining because labour costs fell dramatically relative to capital costs during the recession (slower inflation, slower wage gains or wage givebacks, and dramatically higher real and nominal interest rates).

Table 2.4.2

Annual Productivity Changes by Sector for Ontario

Sector	1981	1982	1983	1984	1985	1986	1987	Average 1981-1987
Goods Producing (39.2%)	2.1%	-0.6%	8.6%	10.5%	3.4%	1.5%	2.4%	4.0%
Agriculture	-2.6	9.6	1.7	14.0	2.3	3.4	5.1	4.8
Mining	-19.9	13.5	22.0	34.0	-17.8	7.1	-4.8	4.9
Other Primary	-5.0	-12.0	4.5	3.7	12.1	31.9	-6.5	4.1
Manufacturing (27.2)	1.9	-4.1	10.3	12.8	4.8	0.4	1.6	4.0
Construction	14.7	6.1	4.7	-2.0	2.7	3.6	4.6	4.9
Utilities	-2.7	12.3	5.6	-2.8	-1.2	-0.4	3.6	2.1
Service Producing (60.8)	-0.7	-1.1	2.3	1.9	1.0	1.3	1.7	0.9
Transport & Communic'n	5.6	-2.9	9.0	4.1	0.0	-0.6	7.6	3.3
Retail Trade	0.2	-4.4	10.2	1.1	3.0	4.2	5.6	2.8
Finance	2.4	-1.9	3.2	-2.9	14.3	-0.8	-1.0	1.9
Community, Business and Personal Services	-1.3	0.3	-3.0	3.5	-1.7	-0.2	-2.1	-0.6
Public Administration	-2.9	2.9	4.0	-1.5	-3.7	3.1	1.5	0.5
Total	0.4	-1.2	4.5	5.2	1.9	1.2	1.9	2.0

(1) Figures in brackets indicate size of key sectors as a percentage of the total.
(2) Productivity results do not correspond exactly with figures used elsewhere because information sources, and sometimes classifications, differ.

Source: Conference Board

An additional factor has confused the issue for Ontario. Productivity was below trend during the 1970s when investment tilted towards western energy resources and has moved above trend in the 1980s because capital found a more profitable home exploiting previously ignored eastern opportunities when the western economy was weak. Table 2.4.2 shows how productivity has performed across the various sectors of Ontario's economy over the 1981 to 1987 business cycle.

2.4.3 The 1990s and Beyond

The downward trend of unemployment suggests that labour is becoming increasingly scarce relative to capital. Future expansion will be forced to rely more heavily on capital increments and far less on a readily available supply of labour. As well labour's price (real wages) will tend to rise with its increasing scarcity, while the cost of capital is expected to fall as the population ages and savings rise. The capital to labour ratio, and thus

productivity, ought to be much higher than during the 1965 to 1980 period. As well there will be strong incentives to use the existing labour stock more efficiently -- by retraining or redeployment -- a factor which may lead to a significant improvement in service sector productivity.

Productivity is not forecast to regain the heady growth rates of 1940 to 1970, partly because the service sector (which has little foreign competition) has grown relatively large and tends to lag the rest of the economy in productivity gains and partly because the manufacturing sector may be more mature with gains harder to achieve. However, these views could eventually be overturned by changes which are already becoming visible. Canada and Ontario will both be stimulated to improve productivity by the advent of increased competition from free trade. New technologies seem likely to find more widespread application as North America lags behind Japan in some industries. Perhaps most interesting is a newly-emerging tendency to focus more on product quality in order to capture markets lost to imports. On first blush improving quality may not appear to affect productivity but if improving quality raises market share, this will lead to larger production runs; the higher profits may in turn raise capital spending.

2.5 Industry Outlook for Canada and Ontario

2.5.1 Basic Global Developments

The long-term growth prospects of any region depend, to a large extent, on the industrial structure of that region and whether the most important industries are likely to register above or below-average growth. Government policy can attempt to shift future growth towards the sectors that are most apt to do well, but no matter how significant the investments that are made, radical shifts are usually not plausible. Any viable new development tends to be dependent on existing attributes.

Global developments, like the oil price shocks of the 1970s and 1980s, also determine the pattern and magnitude of regional expansion. Investments made in response to these developments tend to have a major effect on the direction of future growth in the various provinces. Therefore, it is important that private and public sectors anticipate likely future global developments and adapt quickly and appropriately to the opportunities they create.

The fact that Ontario already has a mature, diversified industrial base, a well educated labour force and world class financial and service sector

support will help us attract the capital required to effect the desirable shifts over the long term. Our recent prosperity, government policies, labour climate and competitive wages will also make it easier for Ontario to adapt to emerging global developments.

a) Trade Liberalization

One of the most notable developments since World War II has been the increasing importance of international trade as a component of economic growth. For the world as a whole, the ratio of exports to GNP has risen dramatically, the most pronounced increase taking place over the last 15 years. Canada's exports to GDP ratio rose from 17.1% in 1961 to 33.2% in 1987. By 1987 the ratio for Ontario was 47%, thus increasing greatly our economic interdependence with other nations. Moreover, since this trend is expected to continue as tariff and non-tariff barriers are reduced, and especially in the case of Free Trade with the United States, Canada's, and to a much greater extent Ontario's, prospects for future prosperity will hinge on our ability to export.

Most studies of the Canada-US Free Trade Agreement (including our own) have concluded that it will have a favourable but relatively modest economic impact. Nonetheless, there may well be negative spinoffs in the early years of the agreement, based on individual industry adjustments in a less protected environment. Moreover with the Canadian dollar now at its highest level in 6-1/2 years it appears that the transition will be even tougher than originally expected. Industries will be faced not only with tariff removal, but also with a more than 15% loss in competitiveness because of the shift in our exchange rate. Furthermore, due to Ontario's high growth rate since 1982, our wages are rising much faster than elsewhere in North America and this has started to erode recent gains in competitiveness achieved by technological advancements.

These developments are extremely worrisome. Whereas in 1985, some eight different Ontario industries were competitive with their US counterparts, by the end of 1987 only transportation equipment and electrical products industries were competitive. With a record like that we may find it increasingly difficult to compete with countries like Japan or Korea.

b) Global Specialization

So far, our primary focus has been on the US market. Eventually, however, the gradually slowing population growth in North America and increasing imports from Newly Industrialized Countries will force

Canadian companies to look increasingly to offshore markets. Right now, some 76.3% of all Canadian exports go to the United States (up from 56% in 1960). While our export share to Japan is increasing, that to the UK and other EEC countries has fallen dramatically.

Canada's almost exclusive concentration on the US market could be very dangerous in the long term, especially considering the escalation of protectionist actions by our neighbour over the past few years. A free trade deal would certainly help to protect our interests. Nonetheless, while it will enhance our access to the American market, it does not guarantee sales in that market and it certainly does not prevent future trade actions. A free trade deal will only make such actions fairer than they have been in the past. To be sure, such a trading arrangement will force Canadian industries to improve productivity much faster than would be the case if the status quo were maintained. Moreover, it should also force us to wean our industries from government subsidies. Still, some industries have a long way to go to become competitive even with their US counterparts. Moreover, our lack of competitiveness with countries like Japan and Newly Industrialized Countries (NICs) like Mexico (auto parts), Brazil (pulp) and Korea (motor vehicles) both in terms of quality as well as price is particularly apparent. Canadian products have been losing market share to these countries. In the United States, for example, our fraction of total imports has dropped from 28% in 1970 to 17.5% in 1987. This may have posed no serious problem in the 1970s when US demand was growing rapidly, but in future as growth slows, maintaining momentum will be much tougher. Even in the few high-growth segments of the market where new products are being introduced, Canada may not even get a foothold unless more resources are devoted to research.

This highlights the need to improve the competitiveness of Canadian products especially in mass produced goods and primary resources not only relative to the United States but also to world competitors. The productivity gains recorded by Ontario manufacturing industries since the 1982 recession have helped our situation. Nonetheless, the wage differential between North America and the NICs continues to put products with a high labour content at a distinct disadvantage. Nor is the 15 to 20% increase in the value of the Canadian dollar between early 1986 and July 1988 helping matters.

Ontario must find special niches in the world market place. We can specialize either in fewer products where we have a definite competitive edge, thus cashing

in on the benefits of economies of scale achieved by longer production runs. Or we can make highly specialized, one-of-a-kind products, requiring extreme skill, a high degree of flexibility, sophistication and knowledge. We can also compete in products containing a high content of research, development and innovation. Services are another area where exports, particulary to LDCs, can be expected to increase dramatically. Nonetheless, unless we start now to capture market share, we will lose out to other industrialized countries who are already aggressively selling their wares to the LDCs. Japan, in fact, has now replaced the United States as the country with the largest trade surplus in services.

c) <u>High-Tech Revolution</u>

Another such area of specialization could be in the production of such high-tech goods as electronics, communications, biotechnology and computers. While all provinces have attempted to lure such industries, Ontario has been the most successful. Government financial support as well as guidance, proximity to large universities, availability of product inputs and a highly skilled work force have been major attractions. Manufacturing and service industries themselves are also providing significant impetus to technological progress. However, although these industries are expected to outperform manufacturing as a whole, they are relatively small in size and at least in the short term will not capture a large share of the output/employment pie. High-tech industries still accounted for only 14.2% of Ontario's total manufacturing output and 13.5% of employment in 1981.

The real impact of high-tech will more likely be in those industries which make their products with high-tech components and use advanced technological techniques to produce them, thereby reducing labour content.

Generally, small companies play a dynamic role in the innovation process. It is the larger industries producing higher value-added, export oriented products, however, which tend to adopt the use of high tech processes faster than small industries since they can spread the costs of R&D and innovation over greater sales volumes. There is also little question that competition spurs the adoption of advanced technology. A North American free trade deal would undoubtedly boost technological innovation and diffusion, as will the increasing presence of Japanese companies in the province. Another interesting observation is that foreign owned firms are generally more technology-intensive than Canadian ones.

Services catering to high-tech are already expanding dramatically. They may well be some of the fastest growing industries in future. The massive ongoing changes in the North American auto and parts industry provide a good example of the use of computer-aided production and design. Robotics, movable work stations replacing assembly lines, and just-in-time inventory planning vastly raise productivity as well as quality. Manufacturers are increasingly farming out to service companies work like design, research, etc, traditionally done "in-house".

d) Shift to Service Industries

Going hand-in-hand with the rationalization and specialization in the manufacturing sector is the faster growth of services industries. Service industries, including wholesale and retail trade, public administration, finance, insurance and real estate, community, business and personal services, accounted for only 46% of Canada's GDP in 1961. By 1987, their share had risen to 52.5%. If utilities are added, this share increases to 63.3%. In Ontario, this trend is much less visible, since services' share of total provincial output has risen only 1.8 percentage points over the past 26 years.

Nonetheless, this trend to services will continue over the long term as North American service companies expand to meet burgeoning domestic requirements as well as emerging needs in the NICs. Specialized, high-tech service companies are taking over many of the tasks previously done by manufacturing firms themselves. This division of expertise is thought to lead to faster adoption of high-tech practices in manufacturing as well as services. It is also thought to promote innovation and foster greater productivity improvements in both industries. North American expertise, in areas like government policy and planning, energy, transportation and communications development, financial and economic planning, computer and legal services, marketing and other consulting, and medical and educational training will be increasingly demanded in the NICs as industrialization proceeds. Furthermore, North American service companies are expected to maintain their competitive advantage in the forecast period since it will be decades before NICs and LDCs are able to raise national educational levels to comparable standards.

The fact that Toronto is the international banking centre of Canada and the head office location for most of the large service companies suggests that Ontario is in a much better position than other provinces to encourage future service sector development. Government policies concerning education and taxation prac-

tices, will become increasingly important if we are to direct labour and capital in this direction and thereby gain competitive advantage.

e) Demographic Shifts

Long-term demographic shifts, specifically the aging of the population structure in industrialized countries like Canada, support the move towards greater service sector focus. The labour force is gradually becoming older, more experienced and better educated. Employment growth in computer and social sciences, engineering and science occupations has been phenomenal over the past 10 years. Investment in service industries and for machinery and equipment in the manufacturing sector is escalating substantially. Trends in consumer demand also suggest a greater stress on service expenditures and luxury goods as the population passes through successively higher age categories. The greater affluence of an older population also suggests that items necessary for survival will diminish in relative significance.

In direct contrast, the population profile of Lesser Developed Countries and Newly Industrialized Countries, with large numbers of children and generally low incomes and educational levels, ensures a growing need for training and support as development proceeds.

2.5.2 Industrial Structure

Gross Domestic Product, Industry Shares of Total (%) Ontario, 1971 to 1987

	Ontario		
	1971	1980	1987
Agriculture	2.1	1.8	1.6
Forestry	0.3	0.3	0.3
Fishing	0.0	0.0	0.0
Mining	1.8	1.3	0.9
Manufacturing	29.5	28.0	27.2
Construction	6.4	5.4	6.6
Utilities	2.4	2.8	2.6
Total Goods Indust	42.6	39.6	39.2
Transportation & Communication	6.5	8.7	8.4
Trade	12.0	10.9	11.0
Fin, Insurance, Real Estate	13.4	15.1	15.9
Community Bus, Pers Service	19.0	19.9	20.4
Pub Admin & Defense	6.6	5.8	5.1
Total Serv Indust	57.4	60.4	60.8
Total Economy	100.0	100.0	100.0

Of all the Canadian provinces Ontario boasts the most diversified industrial structure. Unlike Alberta and Saskat-

chewan with small, resource-based economies Ontario, because of its large size, maturity and the balance of industries and markets for its products, tends to experience a more stable pattern of growth.

Manufacturing is the largest (27.2% of total) sectoral component of Ontario's total output of goods and services and is more important to provincial economic growth than in any other province. Ontario manufacturing industries are also more highly export oriented than the Canadian average. Relative to other provinces, however, Ontario has one of the smallest (3% of total) primary sectors and the second smallest (60.8% of total) service sector.

Ontario, given its manufacturing orientation, surpassed average Canadian growth during the rapid post war expansion of the 1950s and 1960s. Provincial fortunes languished during the 1970s, however, as Canadian development shifted to the energy sector. The first half of the 1980s has brought further radical changes in regional growth patterns. Essentially, recent trends are the direct result of three economic shocks: the 1982 recession, the marked decline in the value of the Canadian dollar through 1983 and 1984 and the sharp drop in world oil prices. Ontario, with her close ties to the US economy and dependence on their demand for our manufactured products, suffered a greater setback during the 1982 recession than many other provinces. However, prodded by the full-scale rebound in demand both here and in the United States, first for consumer durables such as cars, furniture, appliances and later for capital related machinery, equipment and construction materials, the Ontario economy has outperformed all other provinces by a wide margin over the 1983 to 1987 period. Certainly part of this growth can be traced to the drop off in oil sector activity and the ensuing movement of population from the west back into central Canada. It is questionable whether investment in Ontario would have been as strong under different circumstances.

These fairly substantial shifts in regional growth and investment patterns since 1982 have wrought concurrent shifts in provincial industrial structures. Ontario has not experienced the same industrial shifts as the country as a whole. Primary sector output in Ontario has declined in overall importance even more than in the rest of Canada, in response to the massive deterioration in world commodity prices between 1982 and 1986. Ontario manufacturing and construction, in direct contrast to national trends, have actually begun to increase their shares of the total. No doubt,

this is a spin-off of the massive jump in manufacturing output and investment that has taken place since the recession. Furthermore, the service sector has actually declined slightly in importance, contrasting sharply with the visible gain at the national level. The slower growth in public administration is a major factor in Ontario. In addition, since cyclical trends in the service sector normally lag behind manufacturing, services were slower to recover from the recession.

Although Ontario service sector output accounts for a smaller share of GDP than at the national level, service investment has grown much faster than in the rest of Canada. Phenomenal increases have occurred in the trade, finance and commercial industries. Employment in the service sector has averaged almost 61% of Ontario's total between 1982 and 1987. Looking at this in a more dramatic light, considering job losses in agriculture, other primary and manufacturing industries over this period, total provincial employment actually would have declined if not for the remarkable job creation in the service industries. With new technology yielding future gains in manufacturing productivity and with further shifts in responsibility from jobs traditionally done by processing companies to specialized service companies, such trends in service employment will continue.

2.5.3 Long-Term Outlook

Sectoral Developments
Ontario, 1971 to 1986
(Industry Shares of Total, %)

		Primary	Manuf	Services
Output	1971	4.3	29.5	57.4
	1982	2.9	26.5	62.3
	1987	2.8	27.2	60.8
Employmt	1971	6.1	27.3	60.2
	1982	4.4	23.4	62.7
	1987	3.9	22.1	64.2
Investmt	1971	8.1	22.9	50.4
	1982	9.1	23.9	47.6
	1987	4.4	26.0	57.6

It is already apparent that many Ontario industries have recognized the important emerging trends in the world economy and are actively preparing for an environment of greater competition, more sophistication, specialization and global orientation.

In the manufacturing sector, especially, productivity has improved dramatically since 1982. In fact, Ontario manufacturers have increased investment spending for technologically advanced machinery and equipment faster than either the United States or the other Canadian provinces. Companies are specializing in

fewer products and they are raising the export orientation of these products.

Nonetheless, the recent escalation in the value of the Canadian dollar and the heat-up in Ontario wages versus those in the rest of North America, have for all intents and purposes eroded many of the gains in competitiveness made in the 1982 to 1985 period. With a Canada/US free trade deal expected to intensify competition even more, Ontario will be forced to further speed up the process of modernization.

Free trade is judged by many to increase Canada's and especially Ontario's ability to attract foreign capital. The Japanese, for example, plan to use this country as a staging area to enter the huge US market (and maybe even European markets). Ontario has already benefitted from this inflow of funds not only in terms of construction activity and job creation; but because of the many things we can learn from the Japanese: their more effective management style, labour relations and their different production philosophies which put greater stress on quality control. In general, the presence of Japanese companies in Ontario is expected to promote faster adoption of high tech equipment and techniques and speed up the pace of technological progress. Canadian producers want to sell to the Japanese plants now operating in the province. In most instances, however, our products are either not competitive, not of high enough quality or simply do not fit the requirements. Competing with the Japanese on our own turf will be much more difficult than competing with the United States. Thus, over time this should give a bigger boost to productivity than would be the case if the Japanese were not physically located here. Resulting increases in productivity and the move to higher tech and higher quality suggests that our manufactured products will have a higher value added thereby raising the manufacturing industry's share of total GDP. Larger markets and increased export orientation also suggest additional capacity requirements and output.

Consequently, in direct defiance of the longer term shift to services, Ontario manufacturing, at least during the first 10 years of the free trade agreement, will probably gain importance as provincial producers battle to find their market niche and improve their chances of survival in the next century.

A strong and vibrant manufacturing sector almost guarantees a strong service sector. However, while the share of Ontario GDP assumed by services will continue to grow, it may not mushroom (at least in Ontario) as fast as some may have anticipated.

Expansion of investment, employment and output in the service industries has been substantial but at present it does not seem to carry the same urgency as in manufacturing. The Ontario government clearly recognizes the growth potential of service industries in this province, but to date has, for the most part, ignored major policy initiatives in this area. The current thrust in manufacturing can enhance development of service expertise, acting as a catalyst, generating related exports and needs for education and training. Even so, rapid growth in services will probably be postponed until the second half of the 1990s and early in the next century when baby boomers reach retirement age and demand mounts for health care, nursing homes, leisure and recreational services.

At least in this century, the continued gradual decline in Public Administration will also dilute any surge in the economic importance of services.

Sectoral Developments

a) Goods Production

The primary sector has already witnessed a substantial decline in importance. Strong foreign competition, weak demand and prices have forced the aggregate share of total Ontario output assumed by agriculture, forestry, fishing and mining to erode to only 2.8% in 1987. This will probably drop even further to about 2.4% by the year 2005.

Construction may offer reasonable growth prospects in the near to intermediate term but there are few opportunities for long-term expansion. The paucity of residential building during the late 1970s and early 1980s created a shortage of housing stock which is expected to exist until early in the next decade. After that, for demographic reasons, residential construction (currently accounting for 50 to 60% of Ontario's total value of building permits) will gradually assume diminished importance. Capital investment is increasingly trending towards greater relative outlays for machinery and equipment rather than for new or larger plant facilities. There is likely to be a bulge in industrial construction during the initial phases of the free trade pact but after that activity is destined to slow down. Institutional construction, while depressed at present, may witness heightened expansion in the next century as requirements for old age homes, hospital care and adult training facilities multiply. Commercial construction should also perform above the average due to the rising needs for office space paralleling service sector expansion.

Manufacturing, within the context of a North American free trade environment, can probably be expected to achieve further improvements in productivity, competitiveness and quality during the next 10 years. As industries move to higher value added products and increased export orientation, manufacturing as a share of GDP may well increase slightly. However, if by early in the next century products from the Newly Industrializing Countries start to invade the North American market in greater quantities, causing real damage to domestic producers, manufacturing's importance will level off. To survive, Ontario industries will have to concentrate on products which are in high demand, which have a large export market, and which are competitive because of continuing investment in new production techniques and machinery. Longer-term survival will be dependent on these factors as well as the ability of the industry to incorporate advanced technology and high-tech component inputs, especially those which reduce labour input and/or which raise skills requirements of existing employees so as to gain competitive advantage over Newly Industrialized Countries and Lesser Developed Countries.

Industries with the highest growth potential are likely to be electrical and electronics equipment, autos and auto parts, rubber and plastics, metal fabricating, printing/publishing and miscellaneous manufacturing. Paper and allied products, furniture/fixtures, wood products and non-metallic minerals will probably perform about average or marginally below the average. Primary metals and machinery will suffer fairly slow growth, while food and beverages, textiles and clothing, petroleum products, chemicals and tobacco are expected to register the weakest performances in the manufacturing sector. Of course there will be many instances where a particular industry experiences difficulties but isolated companies or groups of manufacturers of a specialized product manage to do extremely well. Machinery, office and miscellaneous equipment, wood, paper and certain chemical products may be in this category. At the other extreme, prospects for agricultural implements and industrial chemicals are extremely poor.

Transportation equipment, for example, Ontario's largest and fastest growing industry during the 1980s, is in for a tough battle in the 1990s and beyond. All producers, domestic and foreign, are viciously fighting to capture as large a share of the North American market as they can get. However, with auto demand (because of demographic considerations) moderating over the next few decades, production is forecast to exceed demand by some three million vehicles or more,

forcing closure of an estimated 11 North American assembly plants. Despite the intense competition, Ontario is expected to fare relatively well in the next decade. For the most part, the vehicle manufacturing facilities located in this province are either new or have been almost totally updated over the past few years. They are some of the most technologically advanced and efficient plants in the world and thus are in scant danger of being shut down. In fact the auto industry probably continues to offer the best growth prospects of any industry over the intermediate term. By the early 1990s when all the new Japanese plants become fully operational, Canada's share of North American vehicle production is projected to increase from the current 15% (up from 12% in 1979) to 18% or 20%. A free trade deal is estimated to spur an additional 2.5% in this industry's output between now and 1998. Plants in Ontario have a 10% to 15% cost advantage over their US competitors and Japanese manufacturers are planning to serve the huge US market and possibly even the European market from Ontario. Assuming that local parts producers are eventually able to provide a more significant share of the Japanese assembly requirements, this sector of the industry will benefit as well.

Nonetheless, despite our strong position within North America, countries like Mexico, Brazil, Taiwan, Korea and Yugoslavia, who are proposing to manufacture vehicles as well as parts, are posing a mounting threat. While Ontario is expected to maintain her advantage through the early 1990s, there is no guarantee that the prosperity will continue beyond that.

Other likely winners of the next few decades are manufacturers of electrical and electronics equipment and certain specialized machinery producers. These products are competitive at present, capital investment has been considerable and export orientation is rising. Canadian firms are internationally competitive in terms of application of micro-electric techniques and have an edge in digital and packet-switching technology.

Exports are likely to expand under free trade because current US tariffs are quite high. While large capacity will promote economies of scale in both industries, perhaps the more critical factor here is that these industries stay at the forefront of technology and specialize production for world markets.

Rubber and plastics could also be in a position to benefit from new discoveries which substitute lighter weight more durable plastics and rubber for traditional materials like cement, wood,

steel, aluminum, paper and glass. The industry in Ontario is tied closely to auto and parts fortunes and thus has generally been outperforming other manufacturing industries. High profits are being funnelled into augmenting capacity, modernization and product development. Even so, this is an extremely small, domestically oriented industry and although free trade may induce additional expansion, the effect on Ontario's total manufacturing sector is unlikely to be significant.

Pulp and paper mills have enjoyed a healthy recovery in the post recession period with a strong economy boosting demand for paper products. Ontario producers are competitive within North America and enjoy a large trade surplus with the United States. This will probably grow when remaining tariffs are removed, especially considering the move to more efficient cost effective thermal mechanical pulping (TMP) and the possibility of increased specialization. One does question, however, the longer term potential of this industry given intensifying competition from lower cost hardwood producers outside North America. Even the most modern mills in British Columbia and Quebec are still considered high-cost marginal producers in the world market. Ontario's recent modernization program will help us through the 1990s, but may still not make us competitive outside North America. Future strategies therefore are likely to direct production to higher value added paper products which our wood species are particularly suited to produce and which are expected to expand in usage over the longer term.

Wood and wood products, while experiencing extremely buoyant conditions in the short term, face somewhat slower growth in the late 1990s and beyond due to more moderate housing construction. Although a fairly average performance is expected from furniture and fixtures, manufacturers of office fixtures are having considerable success in selling to the United States.

Among the slower growth industries will be food and beverages and petroleum products whose production is tied primarily to the domestic market and dependent on population and demographic trends. Both are fairly large manufacturers in terms of value of output and therefore will have definite negative implications for the province's manufacturing sector as a whole over the longer term, offsetting to a large extent the strong growth in transportation equipment.

In the case of chemicals, Saudi Arabia, Kuwait, Mexico and Western Canada will supply much of the future demand for bulk chemicals. While Ontario producers

(especially the inorganic chemicals, plastics and synthetic resins producers) are expected to benefit from free trade, eventually Ontario will be forced to shift to high specialty chemical products such as pharmaceuticals, medicines, polymers and resins for use in electronics, engineering ceramics and plastics. This will require massive restructuring and investment and could ultimately contribute to extremely weak long-term growth in some sectors of this industry.

Primary metals, Ontario's third largest manufacturing industry, is highly competitive and enjoys a trade surplus with the United States. In fact, prospects have improved because of the North American free trade deal. Canadian steel producers have already committed massive investments to modernize processing techniques, reduce labour requirements, boost productivity and improve quality. They have managed to maintain their US customers and at the same time keep import penetration to a fairly constant 10 to 12% share of domestic demand. Nonetheless, in future, growth will become more and more dependent on export markets, a very difficult task given the more than ample capacity and capability of the NICs. The only way we can hope to prosper is through increasing specialization in higher value added product lines. Even then future prosperity is far from secure. Space age plastics and the like could replace steel as a component of cars, planes and even heavy construction.

Tobacco products, textiles, leather and clothing are in a particularly tenuous position. They are not competitive and with output limited to local consumption may not even weather a freer-trade environment with the United States. Printing and publishing, although in a better competitive position, is not export oriented and has a large trade deficit. It would probably suffer under free trade since Canadian companies are not large enough to compete with US giants.

b) Services Production

Assuming the Ontario economy gradually evolves into a more highly specialized industrial state, the service industries will assume greater importance. The recent pattern of strong capital investment and employment growth, especially in the knowledge intensive areas of finance, insurance, accounting, engineering, personal and computer services, etc, will gain even greater momentum over the foreseeable future. As production techniques and production design become more complex, tasks traditionally carried out by manufacturing companies themselves will be farmed out to service companies who specialize in everything from

computerized product design to personnel and financial planning. Because of developments in information and communications technology, there is also a vast potential to export services.

Canadians already have considerable expertise in many areas. We have a substantial and growing surplus on trade in consulting and other professional services, computer services and communications. We are recognized as world class international competitors in banking, life insurance, consulting engineering and real estate development. We have experience in health care systems and public administration which could be sold abroad. Moreover, the sizable knowledge gap between the Industrialized Countries and the NICs suggests that these developing countries will look increasingly to us for assistance. Therefore, it may well be that our best hope for competitive advantage in international trade is not in mass production of goods, but in specialized application of knowledge. The United States and Japan are already actively pursuing export markets for their services. The United States has a huge trade surplus in services (much of it due to its foreign investment income). Canada on the other hand imports a greater value of services than we export. While this deficit (in real terms) is declining rapidly, major changes are still required in awareness, public policy, education, etc, if we are to gain a foothold in these service markets.

Transportation and communications should continue to display higher than average growth, especially in the 1990s, as services assume greater importance and manufacturing companies become more specialized and export oriented. This rationalization suggests a growing trend to large multinational corporations with enhanced requirements for global communications and transportation networks.

Telecommunications technology has advanced radically in the 1980s. There has been increasing sophistication in related business such as data and text services, mobile communications, use of satellites and fibre optics. Deregulation is almost sure to generate even greater opportunities and spur growth greatly beyond what it has already been.

Finance, insurance and real estate companies as well as brokerage firms, pension funds, investment and mortgage companies may well be in a position to register the second highest long-term growth of any service industry. An aging population, greater affluence, greater knowledge, increased specialization and wide spread use of high tech in business, institutional and personal life suggests

increased purchase of business professional and consultants' services. These are also the types of services which can be easily exported to the NICs to assist in the development of new industries.

Demographic, social and technological trends of the future suggest that requirements for community, business and personal services will expand rapidly. In fact, it is the computer experts, the architects, lawyers, scientists, employment agencies, etc, that will take over many of the tasks traditionally done by manufacturers in-house. Also over the next two decades the number of services required to care for a growing number of elderly people will multiply dramatically. These might include anything from nursing homes, medical care and laboratories, to sports and recreation facilities. Services related to working women and to greater affluence will also continue to mushroom, encompassing day care and cleaning services, recreation and eating out. In other areas, the huge and expanding use of computers over the past 10 years has spawned an enormous interest in computer-related services and software. This side of the market is developing much more rapidly than the hardware side. As manufacturing becomes more sophisticated with computers doing the tasks previously performed by workers, education, both academic and technical, plus industry training and retraining will become extremely important. A lack of technically qualified personnel would impede industrial progress, narrow our advantage over the developing countries and thus greatly weaken the growth possibilities for exporting such knowledge intensive services.

The area of wholesale and retail trade is expected to register only average growth over the forecast period. Consumption as a portion of Ontario's GDP is projected to ease lower as the population ages and income is devoted increasingly to savings for retirement rather than for goods acquisition. Undoubtedly, there will be a growing market for new high-tech goods like videos, microwaves, computers, etc. Higher incomes suggest increased spending for semi-durables like clothing. It is the non-durables, the traditional survival items, which decline in importance while outlays for services maintain a constant share of consumer expenditure since things such as medical and educational services are not paid directly by the individual, but through government revenues. Wholesale trade, on the other hand, will offer quite promising growth prospects if our manufacturing industries do become much more export oriented.

Public administration, continuing its trend of the past 10 years, is expected to assume gradually smaller and smaller

shares of Ontario's total output. Nonetheless, the rate of decline will slow dramatically and at some point will level out or even start to rise again. Since the cost of caring for an older population is much higher than for a younger one, the marked upturn in the dependency ratio during the next century suggests rapid escalation in expenditures and greater tax burdens for the middle age groups. Because of the provincial government's expertise in areas of education, health care, etc and its experience to date in coordinating foreign consulting teams, revenues from the export of services will rise considerably. However, this will offer only a very small offset to rising government expenditures.

c) Summary

The sizable shift in Canadian industrial development which has already taken place so far in the 1980s, and the changes in national investment this has triggered, have had a dramatic effect on regional growth patterns and prosperity. Undoubtedly, these developments will have an important bearing on the future course of provincial expansion.

Ontario economic growth has exceeded the Canadian average by a wide margin through the 1983 to 1987 period. Based on the assumption of continuing weak international oil prices over the remainder of this decade and well into the 1990s, the present pattern of development is likely to continue, thus pretty well confirming Ontario's relative prosperity.

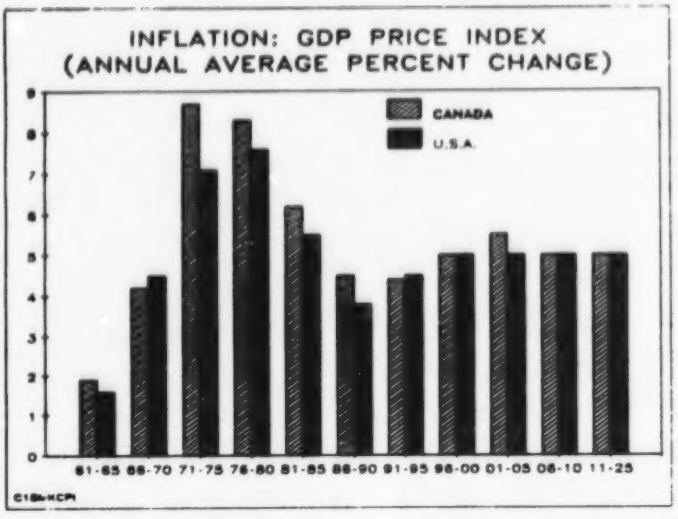
New investment is being attracted into the province prodded along by our new prosperity and by the prospect of free trade with the United Sates. These expenditures are aimed at improving the productivity, quality and design of our manufactured products and at reducing costs through modernization of machinery and production techniques in an effort to compete not just within North America, but around the world. This longer sighted perspective and outward orientation will boost the potential of many Ontario industries. Nonetheless, there is still an immediate need to recognize the significant growth prospects of the service industries. Greater awareness and supporting government policy is required if the province is to gain competitive advantage in this area.

3.0 GOVERNMENT POLICY AND THE LONG-TERM PROSPECTS FOR INFLATION

3.1 Uncertainty Remains High

The long-term inflation rate is among the most volatile and unpredictable variables forecasted. The instability stems from the uncertainty of the future course of government monetary policy. Although changing social and economic factors may have led to expansionary policies during the 1960s and 1970s (resulting in high rates of inflation), there is some evidence to suggest that the policy makers have learned from past errors, making policies which would cause high inflation in the future unlikely.

Chart 3.1



3.2 Examining the Evidence on Past Inflation

A number of explanations have been offered to explain the inflationary bubble which occurred during the past two decades. Among them, has been the demographic argument. According to this, inflation gained its upward momentum in recent decades largely because of changes in the growth of the labour force. During the 1960s and 1970s several factors coincided leading to a prolonged period of unexpectedly high growth. Women's participation rates increased rapidly as social attitudes towards women in the work force changed (resulting in an increase of household incomes). The most significant cause of rapid labour force growth was the increase in the number of young people, as the baby boom generation moved into the working age category. These factors also contributed to the growing structural unemployment problem witnessed between 1965 and 1980.

Government deficits grew during the 1970s, largely due to relaxed attitudes towards increases in social spending. Furthermore, the inflation resulting from the monetization of the US deficits required to finance their involvement in Vietnam was transmitted to Canada. The policy makers of the day resisted increasing taxes to finance these deficits.

Demographic factors may have influenced government policy, but they alone were not sufficient to cause the high inflation rates of the past two decades. If we examine the data, two conclusions can be reached:

(1) There was a high degree of correlation between rapid increases in the money supply during the 1960s and 1970s and the inflation rate.

(2) Changes in Canadian government deficits were not directly reflected in changes in the money supply. Government deficits grew during the 1960s and 1970s, but there was no evidence of a correlation between the federal deficit/gdp ratio and the inflation rate. Indeed, inflation was rising well before we began to witness the huge increases in the budgetary deficits during the 1970s.

Demographic factors may have influenced government policy in the direction of incurring large increases in social spending from the late 1960s to late 1970s. Government monetary policy seems to have been loose in an attempt to reduce unemployment. However, the resulting increases in fiscal deficits were not the cause of inflation. In general, deficits are not in themselves inflationary, but rather it is the method of their finance that matters. If they are financed by increasing taxes or borrowing from the private sector, then this is not inflationary since the government merely diverts savings from the private sector to itself. If, however, the government finances its deficits by monetizing them, then this leads to inflation. Very little monetization of these deficits in fact took place in Canada.

It appears that the best explanation for the high inflation rates is the excessive growth in the money supply. Government policy during the 1960s and 1970s was built on a false premise. The policy makers felt that by allowing the money supply to grow rapidly, they could exploit the tradeoff suggested by the "Phillips curve", an inverse relationship between the unemployment rate and inflation. It suggests that the government can decrease unemployment, by increasing inflation. Furthermore, the policy makers expected that they could exploit this relationship indefinitely. In fact, this policy produced high inflation and reduced the real cost of capital relative to labour, thereby creating an incentive to employ capital instead of labour (precisely the opposite from the desired result). Later research showed this policy action by the government to be an error because workers anticipate higher inflation and incorporate it in the next round of wage

bargaining, creating an accelerating inflationary spiral.

3.3 Implications For Future Inflation

In order to forecast inflation, we must be able to forecast monetary policy. This is not an easy task given the uncertainty surrounding the policy-making rules employed by the Bank of Canada. However, we can draw a number of conclusions from our analysis to give us an indication as to the likely direction of future inflation.

It is evident that policy errors made in the past contributed significantly to the high inflation rates of the 1970s. Policy makers learned from these errors and are unlikely to repeat them in the future. There are indications that the government has recognized the importance of a stable subdued rate of money supply growth in order to control inflation and maintain a more stable economic environment. The current policy of the Bank of Canada is to reduce inflation, so it is expected that they will not yield easily to pressures to increase money supply growth in the near future. The US Federal Reserve has expressed the same resolve in an effort to coordinate monetary policy among the G-7 nations.

However, some uncertainty remains in our forecast. The problems currently experienced by the US banks as a result of bad Third World and domestic debts may create some temptation for the US authorities to inflate. While both Canadian and US banks have increased their reserves and seem prepared to write off some of the bad debts, the problem still poses a threat to the international banking system. Many banks in the US are in trouble and many savings and loans institutions are approaching insolvency. Eventually, the US Federal Reserve Board may be tempted to save these institutions by pursuing a loose monetary policy, and this action could be inflationary. However, the Bank of Canada may not be as constrained as the US Fed, because the Canadian banking system is considered to be in better shape than its US counterpart.

Demographic factors are not expected to be a source of pressure in our forecast. Birth rates declined following the high rates of the baby boom, and as a result the number of people in the 15-24 age bracket is declining. Furthermore, female participation rates are expected to level off in the near future. As labour becomes scarcer there will be much less pressure on government to trade off inflation for employment.

The aging population may lead to an increase in health care spending after the year 2010, imposing some pressure on the government to increase fiscal spending. However, budget deficits need not be inflationary. Future governments may adopt more conservative policies as the population ages (older people tend to own more bonds and will be concerned with preservation of the real value of their pensions and savings and, therefore, will be less inclined to elect governments that pursue inflationary policies).

The inflation forecast has been lowered in the long-run to reflect a continuing conservatism in monetary policy. Policy makers have learned from past policy errors, and are pursuing reasonably disciplined monetary policies. Also, the banking crisis seems to be moving to a new phase (with the banks preparing to write off problem loans) and therefore, the likelihood that the central banks will intervene by pursuing inflationary policies has decreased. Continued vigilance by central bankers could result in further inflation forecast reductions at some future date, but there are too many uncertainties for these reductions to be made with confidence now.

4.0 INTEREST RATES AND FOREIGN EXCHANGE RATES

4.1 The Real Rate of Interest

The largest single cost item for a capital-intensive enterprise like an electric utility is interest. In the last few years, financing charges have represented close to 40 percent of Ontario Hydro's total costs. During the 1980s, interest rates have been unusually high by historical standards, and they have also been unusually volatile and hard to predict on a year to year basis. However, there is an underlying logic to interest rates, based on economic fundamentals, which allows us to have a reasonably good sense of the long-run trend of the real rate of interest. These fundamentals indicate a likelihood that real interest rates will trend downward, but will not return to the levels reached in the 1970s, when they were unusually low.

The real rate of interest is not precisely measurable, but is nevertheless the most meaningful way to discuss interest rates. It is defined as the observed interest rate minus the expected rate of inflation. Taking the inflation rate off the interest rate recognizes that interest is in part a payment to compensate the lenders for the expected erosion in the purchasing power of their principal caused by inflation. From the point of view of the borrower, the money value of the assets which have been purchased with the borrowed funds rises due to inflation, so this part of the interest expense is not a real cost. The increase in the real interest rate since 1979 has had a major impact on capital-intensive enterprises such as electric utilities, making their costs rise relative to those of other goods and services in the economy.

There is, of course, no single real rate of interest, even for an individual borrower such as Ontario Hydro. The real interest rate has to be measured by using the average inflation rate which is expected to prevail over the period for which the loan is outstanding. In the long run, inflation can change dramatically as a result of alterations in government policy. This uncertainty about future inflation represents a major source of risk for the owners of long-term fixed interest rate bonds, and makes it necessary to deal with short-term versus long-term interest rates as two distinct sub-topics.

4.2 Real Interest Rates on Short-Term Borrowing

Short-term interest rates are defined here as the rate on borrowing for terms of one year or less, which means that the

period is sufficiently short that it is relatively unaffected by uncertainty about future inflation and demand conditions. In the past, Ontario Hydro has borrowed funds mainly through conventional bonds with interest rates fixed for terms of 5 to 20 years. More recently, mainly for purposes of diversification, we have started to borrow money through floating rate instruments, where the rate of interest fluctuates with some standard short-term interest rate.

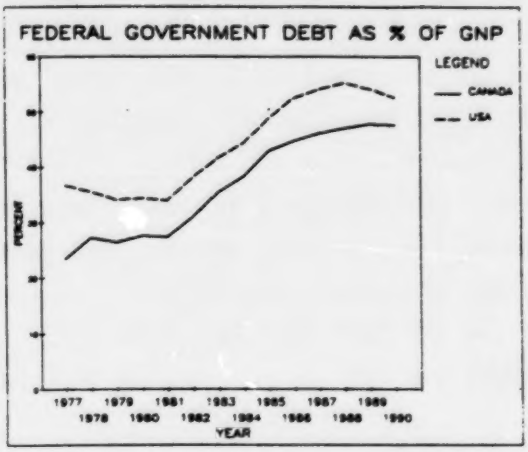
Short-term interest rates are determined in a complex way by both government control and by economic fundamentals. In the short run (perhaps one to two years) the government, or its central bank, is capable of setting almost any short-term interest rate it wants through its power to expand or reduce the money supply.

However, if the real interest rate which results from this process is out of line with the real rate of return on physical capital, it will set off an adjustment process which will eventually force the government to change the interest rate. If the rate which has been set is too high, people will stop borrowing and a recession will result. Conversely, if the interest rate set is too low, people will borrow for speculative and unproductive purposes, and price inflation will get progressively worse.

It had previously been thought by economists that the government had no long-run control over real interest rates at all, because they must ultimately fall into line with the real rate of return on physical capital. However, interest earned on debt is just one form of capital income, with particular risk and liquidity characteristics which make it desirable. Government policy can in fact significantly affect the relative real rates of return on different financial instruments (eg, stocks versus bonds) by changing their relative riskiness.

Recent research indicates that government monetary policy does have a lasting effect on the real rate of interest through the rate of inflation. Money and related financial assets, which are directly controlled by the government, have important liquidity characteristics which make the demand for them relatively insensitive ("inelastic") to the interest rate. People will not convert all their wealth into physical capital to escape the effects of inflation. (And corporations will not want to switch completely to short-term borrowing in order to take full advantage of this lower real interest rate.) As a result, it has been found that the after-tax real interest rate declines roughly half a percent for each one percent increase in the rate of inflation, and vice versa.

Chart 4.1



Government borrowing represents a source of demand for credit, but it influences interest rates in a more complicated way than many economists had initially assumed. Empirical studies have concluded that there is no reliable correlation between the rise of deficits and the level of real interest rates on short-term notes. One explanation of this finding may be that the effects of deficits are partially offset by monetary policy. Some studies indicate that the Federal Reserve has usually printed more money to help mitigate the effect of the deficit. However, this "monetization" has naturally varied depending on the philosophies of the different individuals in charge of the Federal Reserve. This kind of discretionary variation leaves a very complex pattern of data which statistical analysis cannot always unravel.

The most reliable indicator of the impact of government borrowing on interest rates appears to be the total government debt (as a proportion of wealth or GNP). In an efficient capital market there is a high degree of substitutability among assets. Investors who are offered new government debt are not restricted to buying them with just the current year's income. If government debt offers a sufficiently attractive rate of return, they can sell some other part of their portfolio to make room for it. What is important is the overall share of the portfolio which consists of government debt. As the share of public debt in portfolios grows beyond what is wanted for the diversification/safety objective, investors will only be willing to increase that share if the relative rate of return on public debt rises. Recent studies indicate that the real interest rate on US three-month T-bill rates rises about 0.25 percent for each one percent increase in the government debt as a percentage of GNP.

These findings have a very important implication. The common prediction that interest rates will fall quickly when the federal deficit is reduced is likely to prove incorrect. If it is not the deficit, but the overall size of the debt, that is the important determinant of interest rates, then interest rates will be much slower to decline even after

annual deficits are cut. Even though the deficit is falling, the debt to GNP ratio will continue to grow or only decline slowly, and so it will create pressure for high real interest rates in the next several years. It is also important to keep in mind that recent decreases in the observed deficit are partly due to the extended period of economic growth which we have enjoyed. In the fourth quarter of 1987, the US federal government deficit (on a national income accounts basis) had dipped to 3.5 percent of GNP, but on a cyclically adjusted basis (which takes into account the fact that economic activity was above its cyclical norm), it was still at 4.5 percent of GNP.

The cyclically adjusted US Federal Government debt was 42.4 percent of GNP at the end of 1987, and it would decline very slowly if the future government deficit averages three percent of GNP. Even a decline of the deficit ratio to two percent of GNP would bring only a modest reduction, to a debt ratio of about 35 percent at the end of this century. If the deficit stayed as high as 4.5 percent of GNP, the total government debt would rise to 57 percent of GNP by 1999, and would probably impose severe pressure on interest rates and the economy.

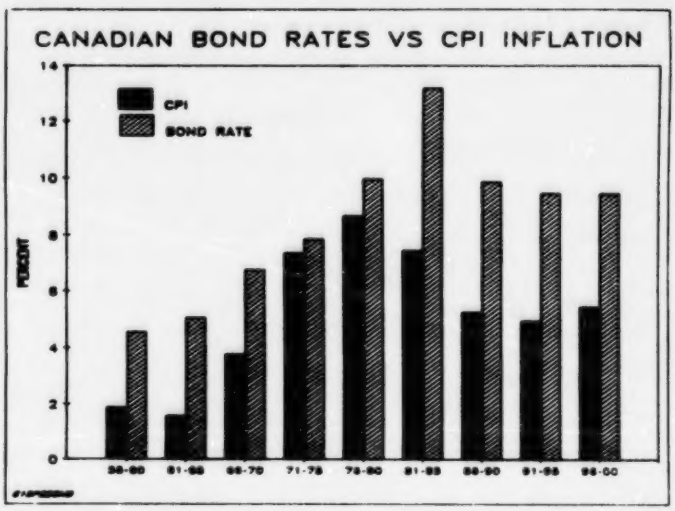
Given political pressures, it might be over-optimistic to assume that the cyclically adjusted deficit will average much less than three percent of GNP over the next ten years. That would leave the debt as a percentage of GNP in the year 2000 about the same as it is currently. That is the fiscal policy assumption which is implicit in our long-term outlook for interest rates. Subsequently, our interest rate forecasts imply a decline of the deficit to roughly two percent of GNP. Our forecast of real interest rates also trends down in the 1990s because of an assumed easing of monetary policy, which is reflected in a slight increase in the inflation rate.

In the more distant future, a major increase in savings rates is expected in North America. As the baby boom generation ages, it will save more for retirement, and this will tend to lower real interest rates.

Canadian government borrowing has relatively little effect on Canadian interest rates, because foreign capital moves into Canada very quickly in response to small variations in relative rates of return. The differential between Canadian and US real interest rates appears to be determined mainly by the degree of risk which foreigners perceive in lending to Canada (which derives partly from the expected risk of inflation). This risk has been heightened in the past decade by the volatility of the Canadian dollar and the

uncertain economic environment, resulting in Canadian Treasury bill rates averaging about two percentage points higher than their US counterparts. Assuming that future monetary policy is aligned in the two countries, in the long run this differential may be expected to decline to be only about one percentage point (which prevailed in more distant history).

Chart 4.2



4.3 Real Interest Rates on Long-Term Bonds

The most distinctive characteristic of fixed interest rate long-term bonds is a high degree of risk associated with uncertainty about future inflation. This is something that financial markets in North America did not realize until the 1960s. For about one hundred years before that, North America had been free of any sustained inflationary trend. Occasional periods of inflation, associated mainly with wars, were offset by occasional periods of deflation. It was only in the 1960s that active government intervention set off a significant inflationary trend, and it took investors in bonds quite a few years to grasp its implications. Through most of the 1960s and 1970s interest rates rose, but not enough to keep up with inflation, and investors frequently earned a negative real rate of interest.

As a result of this experience, they now realize that long-term bonds, once thought of as the epitome of conservative investing, are highly speculative, risky investments. In the 1980s, the volatility of bond market investments has been about the same as stock market investments. Bond investors have earned some large capital gains in recent years as expectations of future inflation fell and, as a result, the expected real yield on outstanding bonds rose. However, they realize that inflation could come back again as a result of careless government monetary policies. Consequently, there is a substantial risk premium embodied in long-term interest rates, and they are usually substantially higher than short-term interest rates.

Empirical analysis has found that there is a direct dependence of the long-term bond yield's risk premium on the government deficit. It seems that in the perception of investors, a higher government deficit creates an additional risk of higher inflation because of the possibility that the government will print more money in the future to cope with its debts. Research indicates that when the US government deficit rises by one percent of GNP, the long-term bond yield rises by about 0.6 percentage points (relative to short-term rates).

Our expectation is that the government deficits will come down only very gradually. In this environment, investors are likely to continue to be apprehensive about the risk of even higher inflation down the road. The forecast predicts that long-term bond yields will generally remain 1.5 percentage points higher than short-term Treasury bill rates (declining to one percent in the very long term), reflecting this risk premium. Of course, the real interest rate differential which will emerge from this will depend very much on the inflation rate actually experienced. If inflation rises sharply, the real cost of borrowing via long-term bonds could still prove to be less than the cost of borrowing via short-term instruments. However, the lessons that governments learned in the 1970s about the costs of inflation are likely to continue to exert an influence which restrains inflationary tendencies. As a result, the effective cost of funds borrowed via long-term bonds is likely to represent a high real interest rate, (closer to four percent than to two percent) at least for the next decade.

4.4 Foreign Exchange Rates

On a relative purchasing power basis, the US dollar (as of mid-July 1988) appeared fractionally overvalued against the German and Swiss currencies, fairly valued against the British pound and undervalued against the Japanese yen. In making this statement it is assumed that two imbalances offset each other and will gradually diminish on a trend-line basis over the next five to ten years--specifically that the shortage of savings in the United States is countered by abnormally high real interest rates such that foreign suppliers of capital are willing to increase their holdings of US assets. The statement regarding the yen is more problematic because of difficulties in determining the yen's underlying value. One problem is that the Japanese currency has been managed for many years such that its quoted value has not been fully subjected to market forces. Because the yen has become a more openly traded international currency in recent years, calculating its value based solely

on inflation differentials may give misleading results depending on the base period selected. A second problem has been the successful shift in the past year from overreliance on export dependent growth to domestic sector-led growth, a shift that could persist for some years and alter the pattern of capital flows.

Over the next year or two the dollar may rise somewhat further, driven by rising domestic interest rates and continuing improvement in the trade balance (and to a lesser degree, in the current account). The trade figures have not yet had time to adjust fully to the substantial currency depreciation of recent years. The recent and expected future rise of the dollar appears too small to have much impact on the balance of payments. Higher interest rates, in addition to attracting foreign capital, ought to dampen economic growth and demand for imports.

Within one or two years the dollar's long-term downtrend is expected to resume because inflation differentials appear unfavourable -- at least relative to Japan, Germany and Switzerland. However, there are signs that inflation differentials are narrowing which, at the very least, ought to slow the US dollar's long-term rate of decline against these currencies. Monetary policy has become more conservative. While government deficits and private debt have mushroomed in recent years, it is not clear whether the debt surge should be interpreted as a sign of on-going profligacy or whether an aging population will bring a reversal of trend. An aging population profile may be accompanied by more conservative fiscal and monetary policies, an increased rate of savings and a slowdown in the growth of private credit demands once the baby boomers pass through the household formation stage towards the middle of the 1990s.

While the forecast assumes that past trends will continue over the long term, some new developments may be occurring overseas which could eventually become dominant factors. For the time being, the following factors are considered as alternative scenario risks.

Japan is being increasingly isolated by the rise of protectionism in her export markets and by the rise of Asian competitors in many of her product lines. In addition to increasing off-shore investment (capital outflows), she may have to rely increasingly on her domestic economy and may begin to stimulate much like the United States in the 1960s and 1970s. Japan is already under pressure to provide more social services and assume a greater proportion of her defence costs. Japan has acquired a relatively large

fiscal deficit and shows signs of increasing the role of government in the economy. These factors could indicate a continued slowing of productivity gains, a tendency to higher inflation, and a slower rate of savings growth.

Table 4.4 indicates another possible source of changing relationships. All countries are expected to experience a significant aging of the population and consequent financial burden (health care, pension costs) on a proportionately shrinking base of taxable wage-earners.

Table 4.4
Percentage of Population that is 65 or older

	1950	1960	1970	1980	1990	2000	2010	2020	2025
Canada	7.7	7.5	7.9	8.9	9.8	10.4	11.4	15.0	17.3
USA	8.1	9.2	9.8	10.7	11.4	11.3	11.5	14.2	15.8
Germany	9.4	10.8	13.2	15.0	14.1	15.4	18.7	19.2	20.0
Switzerland	9.6	10.1	11.4	13.5	14.4	15.9	18.6	21.3	22.0
Japan	4.9	5.7	7.1	8.9	10.9	14.5	17.4	20.0	19.5
United Kingdom	10.7	11.7	12.9	14.9	15.5	15.3	15.6	17.7	18.6

Source: Demographic Indicators, United Nations, 1982

These projections appear to be based on data from the 1970s: the census data for 1980 used in the table on page 12 indicate higher figures for both Canada and the United States, mainly because of longer life expectancies. Unfortunately, comparable data based on a 1980 census are not available for Europe and Japan.

The recent paragons of monetary, if not fiscal, virtue (Germany, Switzerland, Japan) have the most serious imbalances in coming decades and may be tempted to pursue inflationary policies as a result. It may be argued that Germany and Switzerland (which has a wealthy foreign component of retirees) already had high ratios of elderly people in 1980, yet pursued relatively conservative policies. However, growth is stagnating and these countries have shrinking populations. Germany has already begun to experiment with fiscal deficit stimulus (the planned tax cuts are unfunded thus far) and Switzerland has allowed higher monetary growth than usual in recent years, presumably to keep the franc close to the

mark. Germany has maintained unusually low inflation in recent decades in reaction to the hyperinflation of the 1940s, but by 2010 these memories will have lost their impact as younger generations will have filled the policy-making roles. It is not clear to what extent savings rates might rise in the years prior to retirement, providing an offset to the possible need to inflate. (The Japanese, for example have high savings rates partly because the state has been less provident.)

5.0 CANADIAN DOLLAR

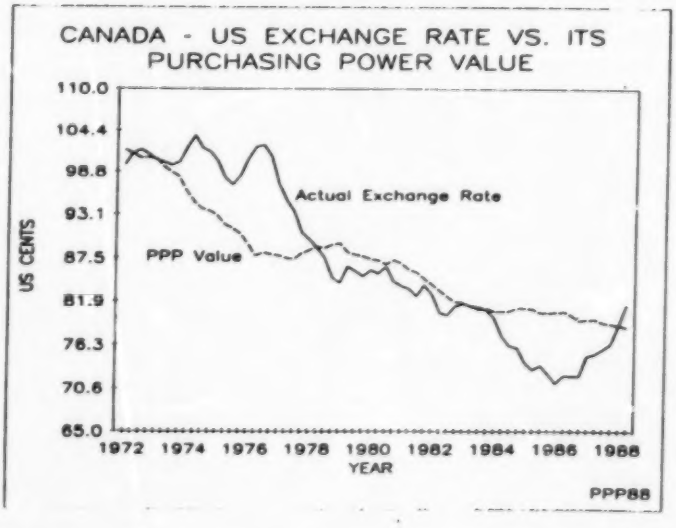
The long-term forecast of the Canadian dollar exchange rate is substantially different this year from that of previous years. We now assume that the Canada-US Free Trade Agreement will be implemented, and as a result the new most likely scenario for the Canada-US exchange rate closely resembles the forecast presented as the free trade scenario in previous years' issues of the Alternative Scenarios.

5.1 Factors Affecting the Canadian Dollar

The adjustments needed to offset inflation differentials between Canada and the United States have been found to be the main factor causing major long-run changes in the exchange rate. This process is described by the purchasing power parity theory (PPP). A number of other factors also affect the exchange rate, particularly in the short term. The most important of these is the rate of capital inflows or outflows from Canada. The level of real commodity prices is also a determinant of the value of the Canadian dollar, because a significant proportion of our exports consists of natural resource commodities.

The logic of purchasing power parity is simple and compelling. Suppose that inflation in Canada causes the costs of producing goods exported to the United States to rise 20%. If there has been no inflation in the United States, then the Canadian dollar must fall about 20% in order to keep Canadian exports to the United States competitive. In reality, this does not happen immediately, or precisely, because it takes time for exporters and importers to respond to new prices. However, over long periods of time it has proven to be a very reliable indicator of trends in the value of the Canadian dollar. The historical relationship over the past eighteen years is shown in Chart 5.1. It can be seen that the downward trend which characterized the Canadian dollar's value over most of this period is explainable by the rise in the Canada's price level relative to the United States.

Chart 5.1



There is nothing magical about this theory, and its actual degree of predictive power depends on the appropriateness of the price indexes used. PPP works relatively well for the Canadian to US dollars, but not nearly as well for other currencies. It works well for Canada and the United States because they are each other's largest trading partner and follow the same economic cycles. The two countries have very similar industrial cost structures, and trade a very wide range of goods which are produced in both countries. This allows a broad price index to be a good indicator of how cost changes will affect trading relationships. The PPP line shown in Chart 5.1 is an average of the values indicated by relative US/Canada manufacturing wages and GNP deflators, and it implies that the correct value of the Canadian dollar in 1988 (assuming that capital inflows were at their 1972 to 1987 average rate) would be 78 US cents.

While the PPP value can explain the overall downward trend of the Canadian dollar's value, there have obviously been significant deviations from it. Part of this is simply due to the length of time it takes for trade flows to adjust to changes in relative prices, and part of it is due to the market's expectations of future depreciation (or appreciation) in the value of the exchange rate. A significant part of these deviations can also be explained by the fluctuations in international capital flows.

The exchange rate changes caused by capital flows are frequently transitory, as the rate of capital inflows fluctuates up and down around its trend. However, a permanent change in the trend of capital movements would cause a permanent deviation from PPP.

In order to invest more abroad (or to become less dependent on foreign capital inflows) Canadians have to increase the world market share of their goods. This can only be achieved by cutting the relative price of Canadian goods in the world market (since the demand for them is not completely elastic). The end result is that, if capital moves out of Canada (or comes in at a slower rate than it used to) there must be a real exchange rate depreciation, which means that the Canadian dollar falls below its value as measured by the simple purchasing power parity.

5.2 Long-Term Forecast of the Canadian Dollar

As Chart 5.1 indicated, the main factor influencing the long-run trend of the exchange rate has been the ratio of US to Canadian prices. During the post-1970 period in which the Canadian dollar has been floating, Canadian inflation has

usually been greater than US inflation, with the result that the purchasing power value of the Canadian dollar has declined relative to the US dollar. For example, the average manufacturing wage rate in Canada rose 25 percent relative to its US counterpart in the ten years from 1974 to 1984, while average productivity growth was about the same in both countries. This disparity in wage escalation necessitated a correspondingly large decline in the value of the Canadian dollar in order to keep our exports competitive.

In explaining Canada's higher inflation in this period, one can point to experimentation with much more liberal fiscal and monetary policies than those prevailing in the United States. The system of floating exchange rates, introduced in 1970, enabled Canada to follow different policies from the United States, whereas under the previous system of fixed exchange rates Canada more or less had to follow US monetary policy in order to avoid balance of payments problems. Political tendencies in Canada have historically been more left-leaning than in the United States, as indicated by the presence of a viable socialist party in parliament, which has occasionally had a significant influence on governmental actions. When there was a perceived tradeoff between inflation and unemployment, Canada was more prone to opt for the inflation.

Until recently, the prevailing expectation was that Canada would probably continue to be more inflation-prone than the United States. This seemed especially likely in the 1982 to 1983 period, when Canadian inflation was running three to four percent per year higher than US inflation. The expectation of higher future inflation in Canada (and hence a lower future purchasing power parity value of the dollar) was probably a factor behind the fact that our dollar was undervalued relative to its PPP value in recent years.

This perception of Canada has changed dramatically in the past year. The strong anti-inflationary stance of the Bank of Canada and the signing of the Canada-US Free Trade Agreement have both been factors in this change, and the two are inextricably linked. Both supporters and opponents of the FTA agree that if Canada is to compete successfully under the FTA, Canadian industry must rigorously control its costs. To help insure this competitiveness, the Bank of Canada has to adopt a stable monetary policy which does not generate a rate of wage inflation which is higher than in the United States. The alternative, of a much more stimulative monetary policy and a lower exchange rate, would buy us an

initial boost in competitiveness, but past experience, from many countries, shows that this boost is only temporary. The subsequent higher inflation and associated financial instability which would result from such a policy would inevitably erode productivity and reduce the willingness of corporations (both Canadian and foreign) to invest in Canada.

The FTA does not absolutely require Canada to follow a monetary policy which is no more inflationary than that of the United States, but it greatly increases the likelihood that this will be the case. The increase in confidence resulting from this may be the largest single factor underlying the recent increase in the value of our dollar. The FTA is likely to lead to a greater alignment between Canadian and US monetary growth rates, and avert a repeat of the large depreciation of the Canadian dollar which occurred between 1976 and 1986.

A relatively smaller, but nonetheless significant, impact on the dollar may result from the influence of the FTA on foreign capital inflows into Canada. Canada is less developed than the other industrial countries, and has had a faster labour force growth rate, creating a degree of reliance on foreign capital inflows. Over the past twenty years, Canada has received a net inflow of capital from the rest of the world, with an average annual value equal to about 2% of GNP. This inflow rose to more than 5% of GNP per year in some periods of rapid capital expansion in Canada, as occurred in the 1974 to 1976 period. As can be seen in Chart 5.1, this was a period in which the Canadian dollar traded above its purchasing power value. By contrast, capital inflows have been unusually weak during most of the 1980s, averaging only 0.9% of GNP in the 1983-1985 period, which is part of the reason why the dollar has been undervalued. Starting in 1987, this situation has turned around again, with capital inflows recently running at around 3% of GNP. This increase may be partly due to improved international expectations about the business climate in Canada due to Free Trade, but other factors, such as the improvements in resource prices, have also contributed.

The Free Trade Agreement is likely to increase capital inflows into Canada for three reasons. One is that Canada is heavily dependent on the United States, which already buys about 75 percent of our exports, even in the absence of a Free Trade Agreement. One of the greatest risks facing the Canadian economy is the imposition of arbitrary sanctions by the United States against Canadian exports. The FTA would reduce

this risk, and therefore make investment in Canada more attractive than it would have been otherwise (even if rates of return on investment in Canada were unchanged). Moreover, the FTA is also likely to increase the rate of return on capital, by means of productivity gains resulting from industries operating at a larger, more efficient scale. Finally, the FTA eases the Canadian government's control over foreign investment, and takeovers below a value of $150 million will no longer need to be approved.

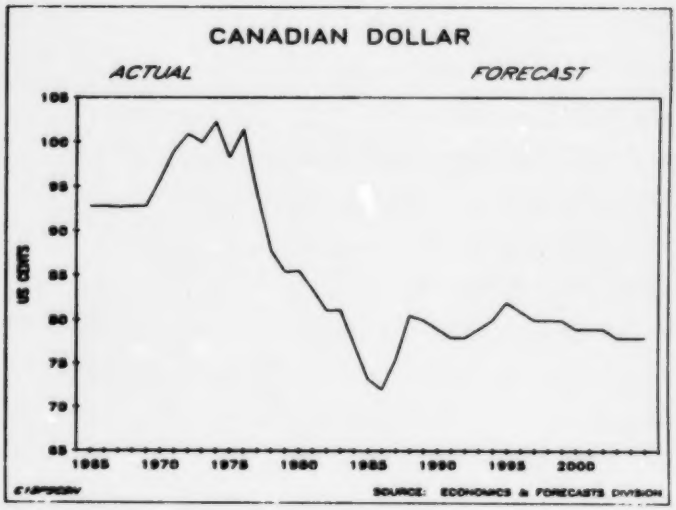
However, while the impact on investment inflows is likely to be positive, most estimates suggest that it will not be large. The increase in productivity due to the relatively small tariff reductions which the FTA will bring about does not have the capacity to increase investment greatly, and some of the capital for the new investment will come from increases in domestic savings. On average, the increase in foreign investment in Canada due to the FTA is unlikely to exceed 0.5% of GNP, but there would probably be some individual years when the impact is larger, especially in the early 1990s. Statistical analysis indicates that the Canadian dollar rises about two cents for each one percentage point increase in capital flows (when the latter are expressed as a percentage of GNP). It is conceivable that in some individual years the Canadian dollar could be increased by as much as five cents as a result of capital inflows, but the average effect would be much less than that.

The positive influence of free trade on capital inflows would be partly offsetting a longer-term downward trend, which is nonetheless expected to continue. Projections of Canadian savings rates, based on demographic factors (in particular, the increase of the average age of the population) indicate that there will be a diminishing need for capital inflows into Canada. In the long term, net capital inflows are expected to decline to zero. An aging population, attracted to warmer climates, would probably also increase Canada's travel deficit. This has the potential to offset any slight increase in the real value of the Canadian dollar which might result from an upward trend in real resource prices.

In fact, there is a possibility that Canada will become a net capital exporter, such as Germany and Japan are today. The United States has an age structure similar to Canada's, and it will probably also experience an increase in saving. This may indicate that the US dollar's real exchange rate will decline relative to the other currencies. Nevertheless, since capital flows into Canada have mainly been from the United States, a decline in these inflows would

imply a slight downward trend in the real exchange value of the Canadian dollar relative to the US dollar.

Chart 5.2



6.0 ENERGY

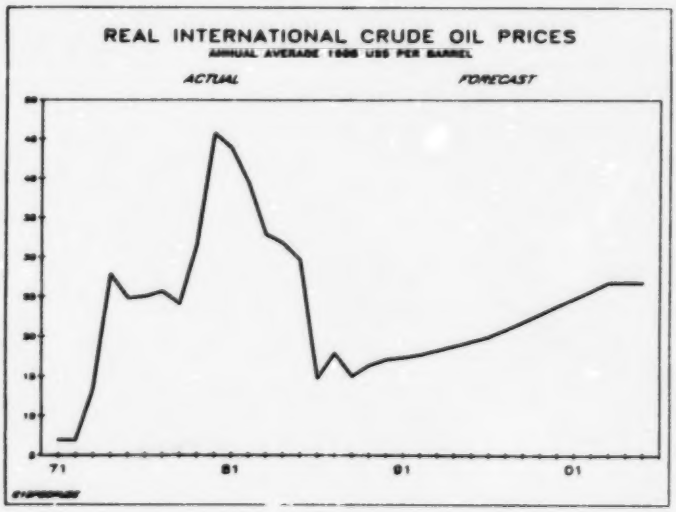
6.1 International Crude Oil

Since our last long-term oil price forecast, a year ago, the international oil market has remained unstable with prices gradually declining from the US$17 to US$18 per barrel range for Saudi Light in July 1987 to around US$13.00 to US$15.50 in July 1988. There were several reasons for the price softness in this period: overproduction by OPEC in the second half of 1987 and in the second quarter of 1988, OPEC's failure to respond to the non-OPEC proposal to reduce oil production, weaker than expected demand, stronger non-OPEC production and a chronic lack of ability by OPEC to manage its excess capacity.

The structure of the international market and its short-term problems have remained almost unchanged. Demand has increased during the last few years but not sufficiently to alleviate OPEC's problem of allocating demand for its oil among its members. Non-OPEC producers have been pumping their oil almost at full capacity with the exception of a few countries cooperating to certain extent with OPEC (eg, Norway, Mexico). The cartel has remained a marginal producer with substantial shut-in capacity and its major problem remains the ability to bring supply in line with demand. In fact, OPEC's inability to control its production or adjust output at times of weakening markets has remained the most important determinant of market instability in the near term.

In December 1986, OPEC signed an agreement to limit its production. Under this agreement, 12 of the 13 OPEC members agreed to limit total production to 15.06 million barrels per day (b/d). Iraq refused to sign the deal, demanding the same quota as Iran, and has been maintaining its production at around 2.5 million b/d bringing the effective quota to at least 17.5 million b/d. More recently OPEC members have increasingly begun to ignore their quotas.

Chart 6.1



A general pattern of price responses to OPEC's production level during the last

year is a good example of how sensitive the oil market remains to even small changes in the supply/demand balance. In the first quarter of 1987, when OPEC production averaged around 16.4 million b/d, prices remained relatively stable. In the last quarter of 1987 and in the second quarter of 1988, when production exceeded the quota by about two million and one million b/d, respectively, prices were under strong downward pressure.

In the medium term (next five years), the international oil market is expected to remain volatile, and the probability of another price collapse remains high. OPEC and its ability to control production in the surplus situation will remain a decisive factor. Prices are expected to remain weak and there is a continuing risk that prices could swing in both directions in response to either political developments in the Middle East or to changes in OPEC (or its major members) strategy.

The 1986 price collapse has rekindled old debates on the more fundamental determinants of long-term oil price movements. The major issues are: the cost and availability of crude oil and its alternatives, conservation and future energy intensity of economic growth, collective responses (both by the producers and consumers) to price perceptions, potential for OPEC's market power and cohesion, etc.

There are still two polar, though to a certain degree plausible, views on the future path for world oil prices: one view sees oil prices returning to a long-term stable trend in the range of US$10 to US$15 per barrel in real terms. The other view warns about a possibility to return to the high prices of the early 1980s of about US$35, in real terms, by the end of the 1990s.

It is our expectation that neither high nor low prices are sustainable in the long run and probably oil prices will move in a more erratic cyclical pattern. It is, however, not possible to forecast the exact timing and amplitude of the swings in the cycles, so our most likely forecast focuses on the long term trend in oil prices.

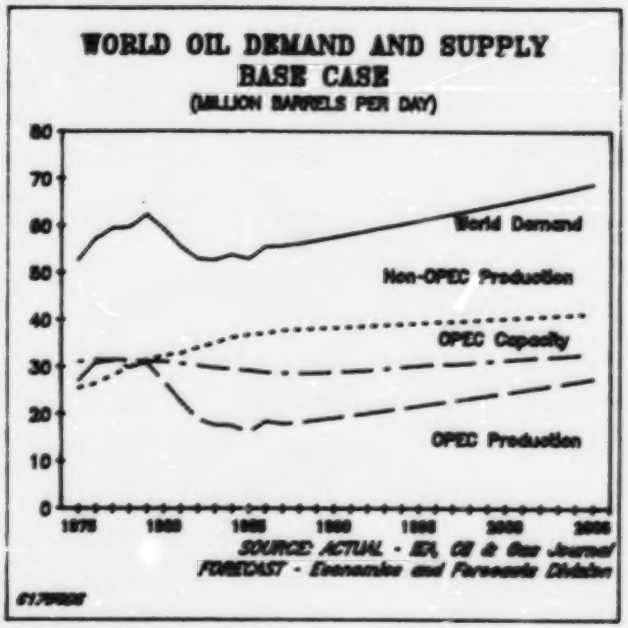
Our most likely long-term oil price forecast and underlying assumptions have not changed much from last year. Stronger upward pressure on world oil prices is expected to resume in the 1990s, especially in the second part of the decade. World demand for oil is expected to be stronger than in the 1980s and the availability of non-OPEC energy supplies in the next decade is expected to be constrained as a result of the adverse investment climate of the late

1980s. Increased demand for OPEC oil is expected to give the cartel more control of the market. In our base case, the real world oil price (in 1988$) is projected to return to the average 1987 level of US$17.90 in early 1990s. In the 1990s, the price is projected to escalate at an average annual rate of about 3.3%, in real terms, (2.5% in the first half and about 4.0% in the second half). The world oil price (Saudi Arabia Light Crude, Persian Gulf), in this most likely trend forecast, is projected to be about US$20 (1988 dollars) by 1995 and about US$23 to US$24 per barrel by the year 2000. Between 2005 and 2025 oil prices are projected to stay constant on average in real terms, although considerable fluctuation in both directions is possible.

However, it must be emphasized that the average growth rates projected in this long-term forecast are not intended to imply smooth trends in world oil prices. It is much more likely that prices will move in several discrete steps in both directions over the forecast period. The most likely trend forecast indicates that neither low prices in the $10 to $15 range nor high prices of the early 1980s at around $40 (in 1988$) are sustainable in the long run, and that a combination of market forces and decisions made by producers and consumers is expected to keep prices in the mid $20s range per barrel on average in the long run. This appears to be the level at which major new unconventional sources are shut out of the market, ensuring OPEC a major role in price setting until new transportation technologies remove the need for portable fuels on a broad scale or a major geographical upheaval in the Middle East takes place.

Our most likely forecast is based on a set of projections of future demand, supply, alternative energy costs, non-OPEC oil availability and costs, political decisions made by producers and consumers, etc. The highlights are summarized below:

Chart 6.2



- World oil consumption is assumed to grow at the rate of about 1.2% annually between 1987 and 2000 -- about half the rate of economic growth. The rate is much lower than in the 1960s and early 1970s when demand for oil was growing faster than economic growth. In the OECD countries, oil consumption is expected to grow at an average rate of about 0.5 to 0.7% per year in the forecast period. Most of the growth will result from continued growth in transportation fuels (especially highway diesel fuel consumption). The fastest growth in oil consumption is expected in South-East Asia where oil consumption is expected to grow on average about 2.5 per cent per year. This view is based on this region's historically high dependence on oil and on an expectation that this region will have the world's fastest economic growth over the next 15 years. Oil demand in the other LDCs is expected to grow faster than in the OECD countries (about 1.5% per year), although there are alarming signals (especially for Africa) of poor economic prospects because of excessive debts. Total world oil demand, including Centrally Planned Economies (CPEs), was about 56.0 mmbd in 1987, and is expected to be about 61.0 mmbd by 1995 and about 68.0 mmbd by the year 2005.

- In 1987, non-OPEC production reached 37.9 mmbd (including CPEs) slightly higher than projected last year and the highest production ever. North Sea output reached its peak in 1985 and is now expected to decline in the early 1990s. It may decline even earlier if oil prices again fall below US$15 a barrel. In this forecast, non-OPEC production is expected to increase slightly by about 0.3 to 0.5 mmbd by 1990. A cautious assumption of stable or slightly increasing non-OPEC production is made for the 1990s (North America and North Sea production down - South America, Africa up). Non-OPEC reserves account for about 20% of world reserves and no major discoveries have been made so far in the 1980s. The best prospects for new oil discoveries are still in Latin America and Africa, but Asia and Pacific regions have been generally disappointing.

- OPEC oil production was around 18 mmbd in 1987, slightly lower than in 1986. Given the projections for world oil demand and non-OPEC output, demand for OPEC oil is expected to be around 19 to 20 mmbd in 1990 and around 25 to 27 mmbd by 2000. OPEC members with relatively low oil reserves (those outside the Gulf Cooperation Council-GCC) are expected to produce at about

80 per cent capacity utilization by 1990 and approach full utilization around 2000. Although excess OPEC production capacity is projected throughout the forecast period, the 1990s are expected to be a period of real price increases. With non-OPEC and OPEC members outside the GCC at or nearing full capacity, producers with large reserves are expected to be able to increase their production and set moderate real price increases, while avoiding the dramatic upward price shocks that bring on alternative supplies.

- One of the major determinants of future oil price trends is the economic viability of potential non-OPEC alternatives. Costs of developing many of these new supplies are estimated to be in the US$15 to US$25 range (in 1988$) per barrel for new conventional oil (in the United States and Europe), in the $20 to $35+ range for secondary and tertiary recovery and tar sands/oil shale, and over $30 per barrel for synthetic oil from gas and coal.

- In the long run, other factors of great importance to the future of oil prices are the distribution of oil reserves and the disparity between production levels, reserves and consumption. Oil consumed in North America and Western Europe accounts for about half of world production. At the same time, these two regions produce only about one third of world oil supplies and have only about 8.0 per cent of the world's proven reserves. As a result, the estimated reserves to production ratio (the number of years proven reserves will last at the current production level) is only about 10 years for North America and 20 years for Western Europe. The same ratio for the Middle East is about 87 years. With more than half the world's reserves, Middle East production policies will be the key to any long-term price outlook.

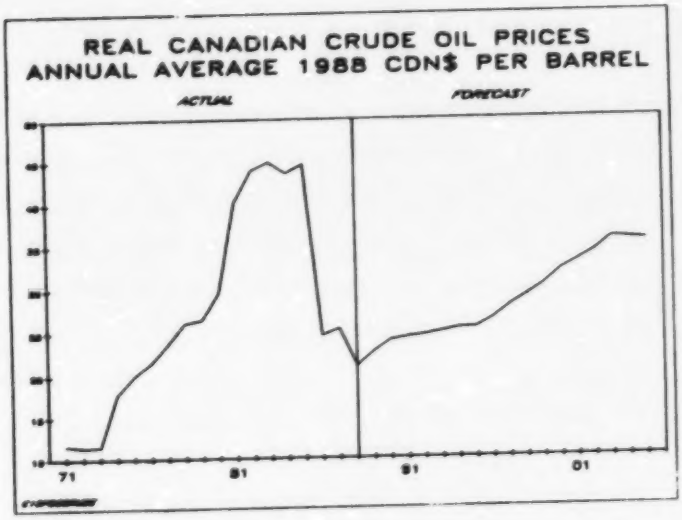
The above considerations suggest that a world oil price of about US$23 to US$27 (real 1988$) per barrel by the 2000/2005 is most likely at this time. Given the increasing uncertainty about the 2006-2025 period, the forecast price has been kept constant in real terms at the level reached around 2005.

It must be remembered, however, that there is a high degree of uncertainty in any projection of oil prices at this time, largely because prices are determined by both market fundamentals and deliberate political decisions, which are very difficult to project. From a wide spectrum of possible price scenarios, we have attempted to select the one - the

most likely trend forecast - to which we assign the highest probability. However, other highly plausible scenarios should definitely be taken into account in the planning process. (Alternative scenarios for oil prices are presented in the Alternative Economic Scenarios document and in the Retail Energy Price Trends report.)

6.2 Canadian Crude Oil

Chart 6.3



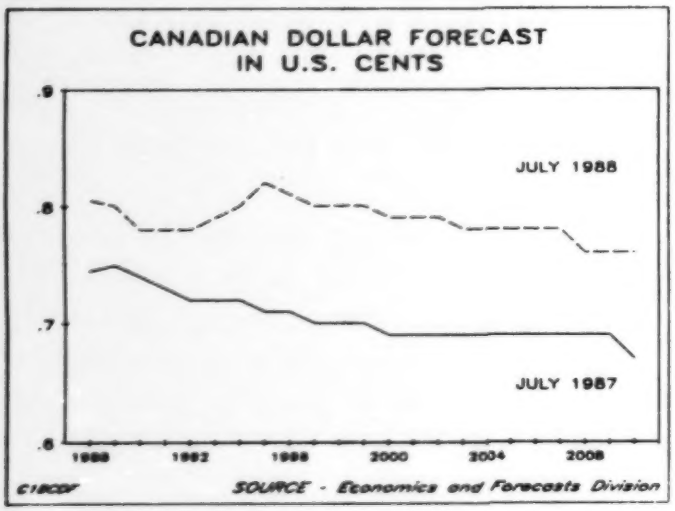
The domestic oil industry now operates in a deregulated environment and prices for domestic crude have been fluctuating with the international oil since 1985. The posted prices in Edmonton are set primarily relative to the spot prices of West Texas Intermediate - WTI (the benchmark American crude) adjusted for quality differentials, exchange rate and transportation costs. According to the industry, in addition to the WTI spot price, the posted prices at Edmonton are based on such indicators as inventories, supply/demand balance and other posted prices in the United States. In addition, it takes several weeks (transportation) before crude oil prices in Ontario (Ontario Refiners' Acquisition Cost-ORAC) reflect price changes in Alberta.

Thus, any price movement on the world market has been relatively quickly transmitted to the domestic market. Canadian oil prices (posted in Edmonton) fell more than 57% from $35.70/bbl in December 1985 to about $15.35 per barrel in July 1986. Since then international oil prices have moved up and down taking domestic postings (at Edmonton) up to around $27 in July/August 1987 and down to below $20 in early 1988. The ORAC reflects those posted prices with some lag but generally has shown the same trend.

Our basic long-term assumption -- that the domestic oil market will continue to be unregulated -- has remained unchanged. Canadian crude prices are expected to fluctuate quite closely with international crude oil on international markets traded in US dollars. That is why any change in the forecast of the Canadian dollar will have an impact on projected

price levels of crude oil in Canadian dollars.

Chart 6.4



A significant upward revision of the Canadian dollar forecast (Chart 6.4) has been made since the previous issue of the Long-Term Outlook. Although our international oil price forecast in the long-run has remained almost unchanged, crude oil prices in Ontario (ORAC) are projected now to be about 10% lower, in real terms, by the year 2000. In this forecast, the real wholesale price of crude oil (in 1988$) in Ontario is projected to be about $25.30/bbl by 1995 and about $32/bbl by the year 2000.

6.3 Canadian Natural Gas

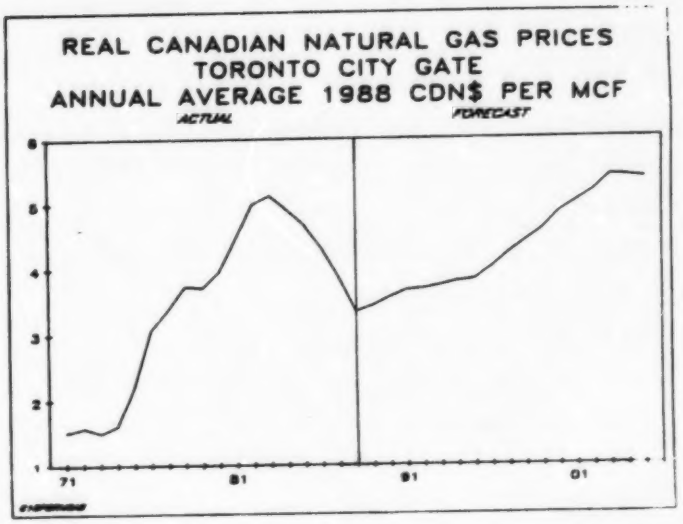
The natural gas industry in Canada has made substantial steps toward a more market- oriented environment since the November 1985 Natural Gas Agreement. However, it is uncertain whether the deregulation process has reached its final stage given conditions specific to the gas industry in Canada (eg, single delivery system, diversified interests of the parties involved, and the regulatory system).

The current system is dominated by two major developments: an agreement between TransCanada Pipeline Limited (TCPL) and the regional distributors to serve the so-called "core market" (residential and majority of commercial buyers), and direct purchases, buy/sell arrangements (by relatively small groups of large industrial users). Canada's future pricing mechanism for natural gas is still uncertain although the deregulation process initiated in 1985 indicates that a more market-oriented environment is inevitable. In the long run, this forecast assumes that a substantially deregulated and open market is going to prevail both in Canada and the United States, and between the two countries, and natural gas prices in Canada are expected to be strongly influenced by US prices and the North American

supply/demand balance for conventional (lower cost) gas.

Currently, due to a deliverability surplus in the United States, and low oil prices, natural gas prices in the United States have been depressed below the average finding cost. Despite the surplus, the adequacy of future production and recoverable resources of natural gas in the United States is highly uncertain. According to the US Office of Technology Assessment several supplemental sources, including unconventional gas, Alaskan gas and increased imports from Canada and Mexico may be required to secure adequate US gas supplies. Similar views may be found in a long-term supply outlook published by the American Gas Association (AGA); sufficient gas supplies will be available but conventional gas production will have to be supplemented by unconventional sources. According to AGA, in 20 years as much as 33% of total US supplies will have to come from sources other than the lower-48 states. This is a substantial increase from the current 6 percent of the total US natural gas supplies. At the same time, future conventional and unconventional gas is expected to be much more expensive.

Chart 6.5



With natural gas prices on the spot market well below the US gas industry's average finding cost of about $2/Mcf (conventional lower-48 reserves) the prospects for exploration and new production are not good.

Given the current market conditions of very weak prices, relatively high finding costs in the United States and projections of a declining US reserve/life ratio, the demand for Canadian gas exports is expected to become strong in the 1990s. The US market is expected to be very attractive for Canadian producers. Already, market deregulation combined with reduced prices and cold weather increased demand for Canadian gas from US customers. Exports of natural gas to the United States increased by over 33% in 1987 to 990 Bcf, the highest

level in over seven years. Canada's share of the US gas market increased to 5.9% in 1987 from 4.6% in 1986. Gas industry estimates that Canadian gas could account for as much as 10 to 12% of total US consumption by the mid-1990s. According to the National Energy Board, natural gas exports to the United States were worth $1.94 billion in 1987. For 1988, exports are expected to grow to $2.2 billion. Increasing export sales are likely to continue, as surplus supply in the United States declines.

Long-term projections for the Canadian supply/demand balance are more optimistic. However, Canadian deliverability from conventional reserves is projected by the NEB to decline rapidly in the 1990s. Additions to reserves and development of frontier sources are critical for future natural gas supply in Canada. Deliverability from these reserves is expected to equal supply from currently contracted reserves by the mid-1990s, and to exceed it in the early years of the next century. These new reserves, however, are much more expensive than conventional gas reserves.

Another important consideration in setting natural gas prices, both in the short and long term, is interfuel competition, primarily in the industrial market. This is already reflected in lower prices for industrial users in Ontario based on the competitive marketing programs introduced in November 1985. Industrial users account for between 50% and 70% of the volume sold by gas distributors and even a partial loss of the industrial market would be a serious matter. Thus, in the industrial sector, competition between Heavy Fuel Oil (HFO) and natural gas is expected to be a major determinant of natural gas prices.

In other sectors, more expensive oil products and electricity might be a decisive factor in setting prices.

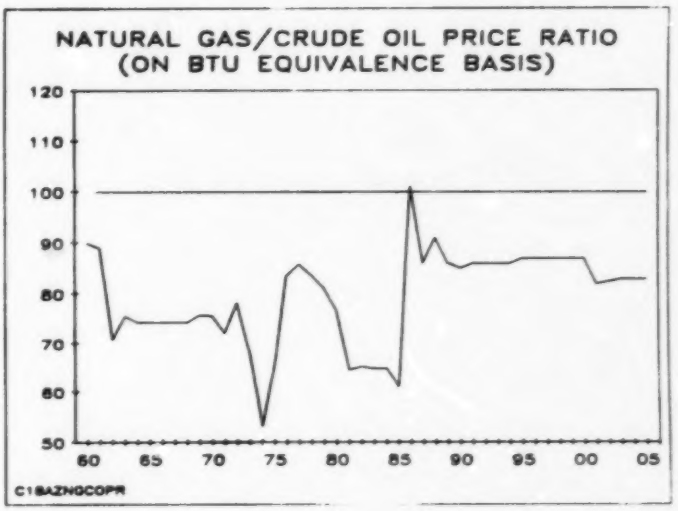
Low industrial gas prices may have the effect of obliging utilities to increase their margins on sales to other customers. In Ontario, natural gas is expected to continue to have a sufficient price advantage in the residential and commercial sectors for the next 10-15 years to support such a strategy. Eventually, some form of market segmentation could evolve with competitive marketing programs for each sector. In addition, with oil prices recovering and improvements being made to refining capability in Ontario, HFO might not be available at such depressed prices (as in 1986 and early 1988) in future. In this forecast, we expect that natural gas can preserve its price advantage over competing fuels, and at the wholesale level natural gas could still be about

15% cheaper than crude oil (on a Btu equivalent basis) by the year 2000.

As a result of falling domestic oil prices and the continuing regulation of domestic natural gas prices, the natural gas/oil price ratio (wholesale prices on a Btu equivalent basis) jumped to over 100% on average in 1986, but is expected to decline gradually in the long run (in 1988 this ratio is expected to average about 88%). With a more market-oriented gas industry, market forces will eventually determine the relationship between these two fuels, as they have in the past, so that the gas/oil price ratio still has a role in forecasting natural gas prices.

In the 1960s and 1970s, the natural gas/crude oil price ratio was close to 75 percent on average. As a result of government intervention in the early 1970s, this ratio fell to below 60% in 1974, then jumped to over 85% in 1977. As a result of the National Energy Program of 1980 and subsequent energy pricing agreements, this ratio was pegged at 65 percent in the early 1980s. It declined to about the 60 percent level on average in 1985 and jumped to over 100% in 1986. Interestingly, this ratio was relatively stable in the 1960s and early 1970s, when energy markets were practically deregulated, and become volatile when the government intervened in either the oil or gas markets.

Chart 6.6



An analysis of the wholesale price of natural gas based on interfuel competition in each market segment indicates that the natural gas/crude oil ratio will probably be about 85% in the 1990s. It is possible that the ratio could be higher should gas markets tighten due to export demand and a premium be attributed to its quality and environmental cleanness. On the other hand, however, the possibility that political pressures might keep natural gas prices in Canada below that which a free market might suggest has led to the decision to keep the forecast ratio at around 85%.

Given our most likely projection for international and domestic oil prices, the wholesale price of natural gas at

Toronto (the average of the negotiated prices for Ontario) is expected to fall in real terms for the rest of the 1980s (to about $3.50 per Mcf, in 1988 dollars, by 1990), and rise again in real terms in the 1990s (to about $4.80/Mcf by 2000 and $5.40/Mcf by 2005).

APPENDIX

Table A.1 Historical and Forecast Data - Rates and Percentage Changes

	Real GDP (1)			Consumer Price Index (1)			Population (1)		Labour Force (1)		Employment (1)		Unemployment Rate (2)		Labour Productivity (1)	
Year	U.S.	Can.	Ont.	U.S.	Can.	Ont.	Can.	Ont.	Can.	Ont.	Can.	Ont.	Can.	Ont.	Can.	Ont.
1964	5.34	6.67	7.29	1.28	1.82	N/A	1.89	2.28	2.75	3.26	3.64	3.85	4.4	3.2	2.92	3.31
1965	5.79	6.60	6.30	1.59	2.46	N/A	1.85	2.35	2.94	2.26	3.77	3.02	3.6	2.5	2.73	3.19
1966	5.79	6.79	6.87	3.02	3.73	N/A	1.85	2.52	3.93	6.16	4.19	6.10	3.3	2.5	2.50	0.72
1967	2.85	2.93	4.33	2.80	3.64	N/A	1.83	2.42	3.40	3.75	2.88	3.13	3.8	3.2	0.05	1.16
1968	4.15	5.35	6.57	4.30	4.02	N/A	1.61	1.91	2.60	3.07	1.90	2.64	4.5	3.6	3.39	3.83
1969	2.44	5.35	5.74	5.46	4.50	N/A	1.46	1.75	3.11	3.27	3.17	3.69	4.4	3.2	2.12	1.97
1970	-0.29	2.60	2.21	5.81	3.38	N/A	1.40	2.22	2.51	3.23	1.11	1.98	5.7	4.4	1.47	0.22
1971	2.84	5.76	5.88	4.31	2.80	N/A	1.28	1.99	2.82	3.58	2.30	2.47	6.2	5.4	3.38	3.33
1972	4.98	5.73	6.58	3.27	4.82	N/A	1.08	1.39	3.02	3.63	2.97	4.05	6.2	5.0	2.68	2.43
1973	5.19	7.71	6.02	6.14	7.61	N/A	1.13	1.35	4.21	3.59	4.98	4.35	5.6	4.3	2.60	1.59
1974	-0.54	4.40	2.18	11.06	10.89	N/A	1.44	1.73	3.95	4.36	4.17	4.23	5.3	4.4	0.22	-1.97
1975	-1.26	2.60	0.62	9.20	10.79	N/A	1.48	1.48	3.47	3.58	1.73	1.50	6.9	6.4	0.86	-0.88
1976	4.89	6.16	5.64	5.76	7.52	7.61	1.31	1.16	2.33	1.68	2.11	1.87	7.1	6.2	3.97	3.70
1977	4.67	3.61	1.93	6.47	8.01	7.86	1.19	1.07	2.90	2.69	1.82	1.78	8.1	7.0	1.76	0.14
1978	5.29	4.57	2.83	7.62	8.90	8.45	1.05	1.02	3.73	3.67	3.46	3.43	8.3	7.2	1.07	-0.58
1979	2.48	3.87	2.70	11.27	9.15	9.01	1.00	0.75	3.07	3.35	4.10	4.12	7.4	6.5	-0.22	-1.36
1980	-0.16	1.48	-0.32	13.54	10.17	9.99	1.23	0.78	3.07	1.85	3.02	1.50	7.4	6.8	-1.49	-1.80
1981	1.93	3.67	3.41	10.32	12.47	12.11	1.23	0.67	2.87	2.60	2.77	2.91	7.5	6.6	0.87	0.48
1982	-2.55	-3.22	-4.16	6.15	10.79	10.70	1.01	0.90	0.58	0.99	-3.25	-2.49	11.1	9.8	0.04	-1.71
1983	3.57	3.16	5.34	3.17	5.82	6.23	0.84	1.10	1.69	1.37	0.78	0.71	11.9	10.4	2.37	4.59
1984	6.78	6.28	8.71	4.31	4.34	4.93	0.77	1.21	1.83	2.10	2.51	3.59	11.3	9.1	3.68	4.94
1985	3.03	4.25	5.03	3.55	3.95	4.05	0.76	1.18	1.95	2.60	2.83	3.75	10.5	8.1	1.38	1.24
1986	2.93	3.33	6.21	1.89	4.17	4.28	0.76	1.20	1.82	2.29	2.85	3.48	9.6	7.0	0.46	2.64
1987	2.90	3.85	4.23	3.70	4.37	4.71	1.04	1.68	1.94	2.38	2.75	3.32	8.9	6.1	1.07	0.88
1988	3.50	3.80	3.90	4.10	4.10	4.50	1.00	1.80	1.80	3.10	2.90	3.90	7.7	5.4	0.80	0.00
1989	2.50	2.50	2.70	4.90	4.80	4.80	1.00	1.60	1.90	2.20	1.80	2.70	7.8	5.0	0.70	0.00
1990	1.80	2.10	2.30	4.40	4.50	4.60	0.90	1.50	1.90	2.00	1.70	2.10	8.0	4.9	0.40	0.20
1991	3.00	3.20	3.50	3.90	4.50	4.50	0.90	1.40	1.70	1.90	2.00	2.00	7.8	4.7	1.20	1.50
1992	2.70	3.40	3.80	4.50	4.50	4.50	0.80	1.30	0.80	1.40	1.30	1.90	7.5	4.2	2.10	1.90
1991-1995	2.50	3.20	3.20	4.50	4.20	4.50	0.80	1.10	1.00	1.30	1.40	1.50	7.3	4.1	1.80	1.70
1996-2000	2.50	2.60	2.80	5.00	5.00	5.00	0.70	0.80	0.60	1.00	0.80	1.00	5.3	4.1	1.80	1.90
2001-2005	2.50	2.60	2.40	5.00	5.50	5.50	0.60	0.60	0.60	0.80	0.60	0.90	5.0	3.8	2.00	1.50
2006-2010	2.30	2.10	2.10	5.00	5.00	5.00	0.50	0.50	0.40	0.60	0.40	0.50	5.0	3.8	1.70	1.60
2010-2025	2.00	1.70	1.70	5.00	5.00	5.00	0.40	0.40	0.00	0.00	0.00	0.00	5.0	3.8	1.70	1.70

1. Average Annual Percent Change
2. Percent

Economic Outlook, September 1988

Table A.1 (Cont'd) Historical and Forecast Data - Rates and Percentage Changes

Year	Avg. Hourly Earnings Manufacturing (1) Can.	Ont.	Avg. Hourly Earnings Construction (1) Ont.	Treasury Bill Rate Canada(2)	Prime Rate Canada(2)	Prime Rate U.S.(2)	Government Of Canada Intermed. Term(2)	Government Of Canada Long-Term(2)	Canadian Dollar(3)
1964	3.69	4.04	4.00	3.75	5.75	4.50	4.72	5.18	92.71
1965	4.74	5.34	9.62	3.98	5.77	4.53	4.90	5.21	92.77
1966	6.07	5.07	9.65	4.99	6.00	5.63	5.55	5.69	92.82
1967	7.05	6.58	8.80	4.64	5.92	5.63	5.64	5.94	92.70
1968	7.34	7.41	8.09	6.27	6.92	6.28	6.68	6.75	92.81
1969	8.11	8.43	11.90	7.19	7.96	7.95	7.66	7.58	92.87
1970	8.06	8.48	16.11	5.99	8.17	7.91	7.11	7.91	95.81
1971	8.87	8.79	12.04	3.56	6.48	5.72	5.55	6.95	99.03
1972	7.80	7.78	9.58	3.56	6.00	5.25	6.26	7.23	100.95
1973	8.90	8.89	9.59	5.47	7.65	8.02	6.98	7.56	99.99
1974	13.50	11.48	10.89	7.82	10.75	10.80	8.12	8.90	102.25
1975	15.62	14.42	11.58	7.39	9.42	7.86	7.71	9.03	98.33
1976	13.83	13.20	14.15	8.87	10.04	6.84	8.35	9.18	101.42
1977	10.85	10.25	12.12	7.33	8.50	6.82	7.90	8.70	94.09
1978	7.12	6.73	5.53	8.68	9.69	9.06	9.00	9.27	87.71
1979	8.79	8.26	6.64	11.69	12.90	12.67	10.42	10.21	85.37
1980	10.11	9.29	9.61	12.79	14.25	15.27	12.37	12.48	85.53
1981	12.00	11.68	10.96	17.72	19.29	18.87	15.68	15.22	83.41
1982	11.75	11.36	8.35	13.63	15.81	14.86	14.00	14.26	81.07
1983	7.08	6.94	6.46	9.31	11.17	10.79	10.61	11.79	81.14
1984	5.87	6.57	1.50	11.06	12.06	12.04	11.91	12.75	77.25
1985	3.86	3.96	3.37	9.43	10.58	9.93	10.39	11.04	73.24
1986	3.14	4.28	3.49	8.97	10.52	8.33	9.21	9.52	71.97
1987	2.43	3.70	7.00	8.15	9.52	8.20	9.42	9.95	75.42
1988	4.50	5.50	4.50	9.20	10.50	9.30	9.70	10.30	80.50
1989	5.00	5.00	5.00	9.70	11.00	10.10	9.90	10.40	80.00
1990	5.00	5.00	5.00	9.10	9.50	8.40	8.50	9.00	79.00
1991	5.00	5.00	5.00	8.10	9.00	7.90	8.50	9.00	78.00
1992	5.00	5.00	5.00	8.50	9.50	8.30	9.00	9.50	78.00
1991-1995	5.00	5.80	5.80	8.20	9.00	8.40	9.00	9.20	79.00
1996-2000	5.90	6.00	5.90	8.20	9.00	8.50	9.00	9.50	80.00
2001-2005	7.00	7.00	7.00	8.10	9.00	8.00	9.00	9.50	78.00
2006-2010	7.00	7.00	7.00	7.60	8.50	7.80	8.50	9.00	77.00
2010-2025	6.50	6.50	6.50	7.10	8.00	7.50	8.00	8.50	75.00

1. Average Annual Percent Change
2. Percent
3. U.S. Cents

Economic Outlook, September 1988

Table A.2 Historical and Forecast Data - Levels and Indexes

Year	Real GDP U.S.(1)	Real GDP Can.(2)	Real GDP Ont.(2)	Consumer Price Index U.S.(3)	Consumer Price Index Can.(4)	Consumer Price Index Ont.(4)	Population (5) Can.	Population (5) Ont.	Labour Force (5 Can.	Labour Force (5 Ont.	Employment (5) Can.	Employment (5) Ont.	Labour Productivity (6) Can.	Labour Productivity (6) Ont.	Avg. Hourly Earnings Manufctrng (7) Can.	Avg. Hourly Earnings Manufctrng (7) Ont.	Avg. Hourly Earnings Cnstructn (7) Ont.
1964	1,973	164,504	66,997	31.0	33.2	N/A	19,277	6,627	7,003	2,567	6,699	2,483	24,556	26,982	2.02	2.06	2.08
1965	2,088	175,359	71,220	31.5	34.0	N/A	19,634	6,783	7,209	2,625	6,951	2,558	25,227	27,842	2.12	2.17	2.28
1966	2,208	187,263	76,110	32.5	35.2	N/A	19,998	6,954	7,492	2,787	7,242	2,714	25,857	28,043	2.25	2.28	2.50
1967	2,271	192,752	79,405	33.4	36.5	N/A	20,364	7,122	7,747	2,891	7,451	2,799	25,871	28,369	2.40	2.43	2.72
1968	2,366	203,072	84,625	34.8	38.0	N/A	20,692	7,258	7,948	2,980	7,592	2,873	26,747	29,455	2.58	2.61	2.94
1969	2,423	213,946	89,479	36.7	39.7	N/A	20,994	7,385	8,195	3,077	7,833	2,979	27,313	30,037	2.79	2.83	3.29
1970	2,416	219,498	91,456	38.8	41.0	N/A	21,288	7,549	8,401	3,177	7,920	3,038	27,713	30,104	3.02	3.07	3.82
1971	2,485	232,137	96,835	40.5	42.2	N/A	21,559	7,699	8,637	3,290	8,103	3,113	28,649	31,107	3.28	3.34	4.28
1972	2,609	245,441	103,203	41.8	44.2	N/A	21,793	7,806	8,898	3,410	8,344	3,239	29,417	31,863	3.54	3.60	4.69
1973	2,744	264,369	109,411	44.4	47.6	N/A	22,040	7,911	9,273	3,532	8,759	3,380	30,182	32,370	3.85	3.92	5.14
1974	2,729	276,006	111,795	49.3	52.8	N/A	22,357	8,048	9,639	3,686	9,125	3,523	30,249	31,733	4.37	4.37	5.70
1975	2,695	283,187	112,483	53.8	58.5	59.1	22,688	8,167	9,973	3,818	9,283	3,576	30,508	31,455	5.06	5.00	6.36
1976	2,827	300,638	118,827	56.9	62.9	63.6	22,985	8,262	10,206	3,882	9,479	3,643	31,718	32,618	5.76	5.66	7.26
1977	2,959	311,504	121,117	60.6	67.9	68.6	23,260	8,350	10,502	3,987	9,651	3,708	32,276	32,664	6.38	6.24	8.14
1978	3,115	325,751	124,539	65.2	73.9	74.4	23,503	8,435	10,894	4,133	9,986	3,835	32,622	32,474	6.84	6.66	8.59
1979	3,192	338,362	127,901	72.6	80.7	81.1	23,738	8,498	11,228	4,271	10,395	3,993	32,551	32,031	7.44	7.21	9.16
1980	3,187	343,384	127,486	82.4	88.9	89.2	24,030	8,564	11,572	4,350	10,709	4,053	32,066	31,455	8.19	7.88	10.04
1981	3,249	355,994	131,831	90.9	100.0	100.0	24,325	8,621	11,904	4,464	11,006	4,171	32,346	31,607	9.17	8.80	11.14
1982	3,166	344,543	126,352	96.5	110.8	110.7	24,571	8,699	11,974	4,508	10,648	4,067	32,357	31,068	10.25	9.80	12.07
1983	3,279	355,445	133,096	99.6	117.2	117.6	24,778	8,795	12,176	4,570	10,731	4,096	33,124	32,494	10.97	10.48	12.85
1984	3,501	377,755	144,686	103.9	122.3	123.4	24,970	8,901	12,399	4,666	11,000	4,243	34,342	34,100	11.62	11.17	13.04
1985	3,607	393,817	151,970	107.5	127.2	128.4	25,158	9,006	12,640	4,787	11,311	4,402	34,816	34,523	12.06	11.61	13.48
1986	3,713	406,931	161,407	109.6	132.5	133.9	25,350	9,114	12,870	4,897	11,634	4,555	34,977	35,435	12.44	12.11	13.95
1987	3,821	422,602	168,228	113.6	138.2	140.2	25,613	9,267	13,120	5,013	11,954	4,706	35,351	35,748	12.75	12.56	14.93
1988	3,955	438,661	174,789	118.3	143.9	146.5	25,869	9,434	13,356	5,168	12,301	4,890	35,661	35,748	13.32	13.25	15.60
1989	4,054	449,627	179,508	124.1	150.8	153.5	26,128	9,585	13,610	5,282	12,522	5,022	35,906	35,748	13.99	13.91	16.38
1990	4,127	459,070	183,637	129.5	157.6	160.6	26,363	9,729	13,869	5,388	12,735	5,127	36,047	35,818	14.68	14.61	17.20
1991	4,250	473,760	190,064	134.6	164.7	167.8	26,600	9,865	14,104	5,490	12,990	5,230	36,471	36,344	15.42	15.34	18.06
1992	4,365	489,868	197,287	140.6	172.1	175.4	26,813	9,993	14,217	5,567	13,159	5,329	37,227	37,022	16.19	16.11	18.96
1995	4,809	554,570	222,484	167.7	202.3	209.1	27,681	10,419	14,824	5,856	13,925	5,634	39,825	39,492	19.68	20.33	23.94
2000	5,441	630,512	255,426	214.1	258.2	266.9	28,664	10,843	15,274	6,155	14,491	5,921	43,510	43,138	26.21	27.21	31.89
2005	6,156	716,853	287,584	273.2	337.5	348.9	29,534	11,172	15,738	6,405	14,931	6,192	48,011	46,442	36.76	38.17	44.73
2010	6,897	795,351	319,075	348.7	430.7	445.3	30,280	11,454	16,055	6,600	15,232	6,349	52,215	50,258	51.56	53.53	62.73
2025	9,283	1,024,173	410,873	724.9	895.4	925.7	32,148	12,161	16,055	6,600	15,232	6,349	67,238	64,717	132.61	137.67	161.34

1. Billions of 1982 Dollars
2. Millions of 1981 Dollars
3. 1982 to 1984 = 100
4. 1981 = 100
5. Thousands
6. 1971 Dollars
7. Dollars

Economic Outlook, September 1988